Check List the journal of biodiversity data

ANNOTATED LIST OF SPECIES

Check List 15 (6): 997–1029
https://doi.org/10.15560/15.6.997

PENSOFT

Fish fauna in and around the Rapids of Mboungou Badouma and Doumé Ramsar site, Gabon

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Abstract
We assessed the fish diversity of the Ogooué and Sébé rivers in and around the Rapids of Mboungou Badouma and Doumé Ramsar site in Gabon. The ichthyofauna of this region has not been extensively sampled in over 150 years, yet encompasses one the most important type localities for fishes in Central Africa. We sampled a total of 31 sites and collected nearly 3000 fish specimens representing 97 species. Nine species appeared to be new to science, and one catalyzed the recent description of a new genus of mormyrid fishes.

Keywords
Africa, assemblages, fishes, freshwater, Ogooué, tropics, conservation.

Academic editor: Eva Decru | Received 18 October 2019 | Accepted 20 May 2019 | Published 15 November 2019

Citation: Cutler JS, Mvé-Beh J-H, Sullivan JP, Fermon Y, Sidlauskas BL (2019) Fish fauna in and around the Rapids of Mboungou Badouma and Doumé Ramsar site, Gabon. Check List 15 (6): 997–1029. https://doi.org/15.6.997

Introduction

Gabon's Ogooué River harbors at least 265 species of fish, thus forming a major component of Central Africa's highly diverse freshwater fish fauna (Brooks et al. 2011; Fermon et al. 2013). The Ogooué is the fourth largest river in Africa by discharge (following the Congo, Niger, and Zambezi), stretching for 1,200 km and draining roughly 75% Gabon and small portions of Republic of Congo, Cameroon, and Equatorial Guinea. With a rural density of 1 inhabitant/km^2, the Ogooué is considered one of the world's most pristine large tropical rivers (Braun et al. 2017). However, as Gabon develops its mining, timber, and hydroelectric industries, existing and planned projects pose risks to its freshwater ecosystems and the species they support.

To protect part of the Ogooué, the Government of Gabon declared the Rapids of Mboungou Badouma and Doumé as a Ramsar site (Fig. 1; Mengue Medou et al. 2002). Ramsar sites are wetlands of international importance, and this Ramsar site protects the mainstem Ogooué between Lastoursville and Moanda in the Ogooué-Lolo and Haut-Ogooué provinces of southeastern Gabon. The Ramsar site stretches for 140 km and extends 2 km in both directions from the Ogooué, covering a total of 59,500 ha of river and riparian habitat.

The Rapids of Mboungou-Badouma and Doumé Ramsar site has been very poorly sampled for fishes in comparison to other regions of the Ogooué basin. The FAUNAFRI website (http://www.poissons-afrique.ird.fr/faunafri/, accessed on 2018-10-25) indicates no fish

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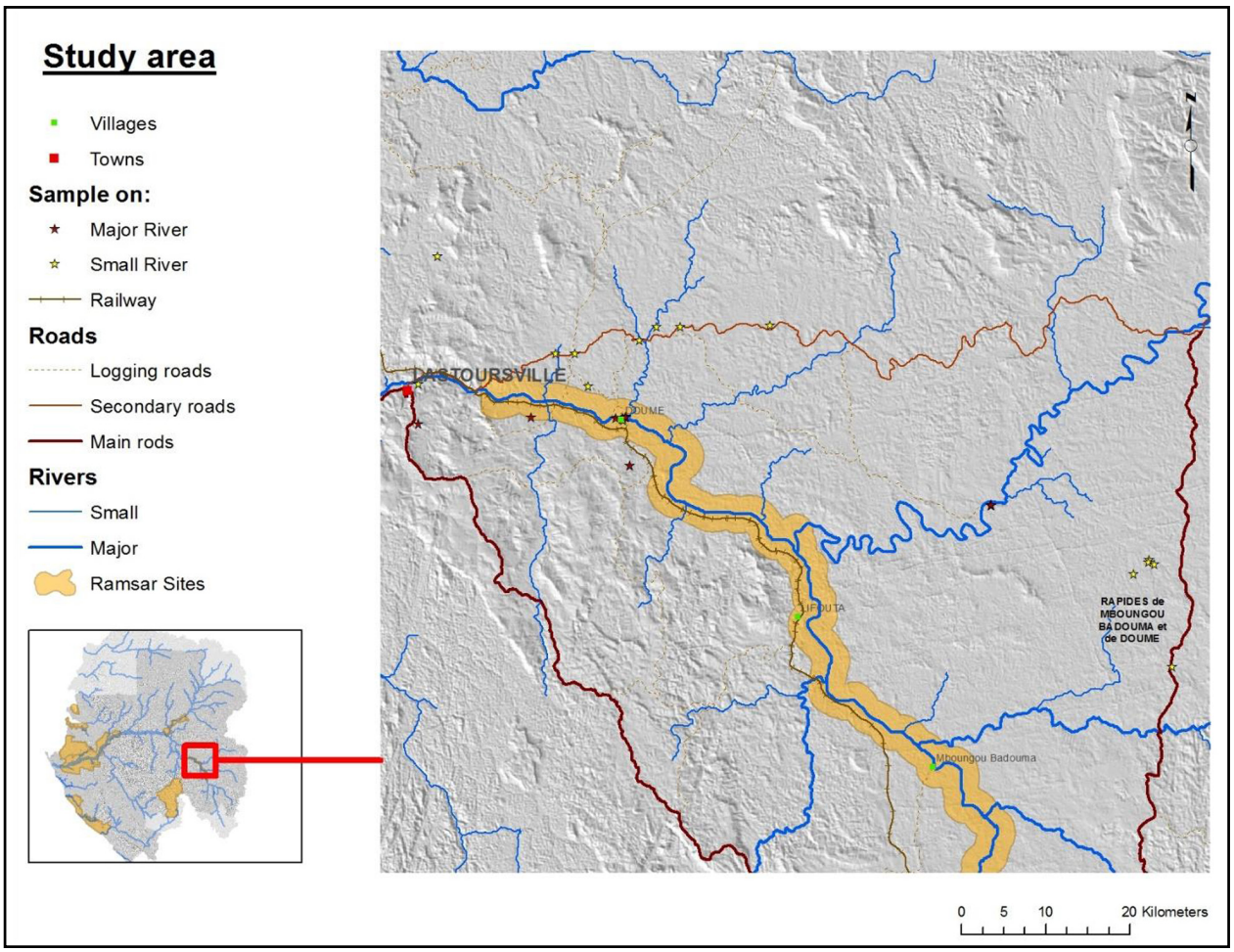

Figure 1. Sampling localities September 2014. The Rapids of Mboungou-Badouma and Doumé Ramsar site is highlighted in yellow. Sampling localities on small river sites appear as yellow stars, large river sites appear as black stars.

collection sites on the Ogooué mainstem between Lastoursville and the Sébé River confluence apart from those conducted by Alfred Marche at Doumé in 1876–1877 and subsequently described by Henri Sauvage (1879, 1880). Despite limited sampling, those early collections make Doumé (00.843°S, 012.96°E) arguably the most important type locality for fishes of the Ogooué. Marche's collections yielded numerous species descriptions including 10 new species of fishes from around the Doumé Falls, nine of which are still valid: *Mastacembelus marchei*, *Mastacembelus niger*, *Atopochilus savorgnani*, *Doumea typica*, *Clarias buthupogon*, *Labeobarbus compiniei*, *Ivindomyrus marchei*, *Paramormyrops sphekodes*, and *Petrocephalus simus*. A fourth mormyrid, *Petrocephalus afinis*, proved to be a synonym of *Stomatorhinus walkeri* (Günther 1867). Two other siluriforms, *Malapterurus oguensis* and *Parauchenoglanis balayi*, came from Marche's collection at Lopé.

We conducted a fish sampling expedition in the Rapids of Mboungou Badouma and Doumé Ramsar site in September 2014 organized and funded by The Nature Conservancy. Team members included representatives from Gabon's Institut de Recherches Agronomiques et Forestières (IRAF) of the Gabonese Centre National de la Recherche Scientifique et Technologique (CENAREST), Oregon State University, Cornell University, the University of California Santa Cruz, the association AIMARA, and The Nature Conservancy. The expedition aimed to sample fish diversity within, and around the Ramsar site, thereby providing a more comprehensive assessment of the site's ichthyofauna. These baseline data provide the foundation to build a framework for more effective management, conservation, and development of this biologically and historically significant region.

Methods

Study area. The list of species presented is based on collections made at 31 sites within and around the Rapids of Mboungou Badouma and Doumé Ramsar site between September 6 and 21, 2014 (Fig. 1). We assumed fish community composition would depend upon stream size and therefore we sampled not only the mainstem Ogooué and Sébé, but also major tributaries, forest streams, creeks, and springs (Table 1, Fig. 2). We sampled in two primary regions: on the Ogooué mainstem near Doumé (sites 1–21), and on the Sébé River near Lelama close to the confluence with the Ogooué (sites 22–31; Table 1). This region has few roads and the best access to the river

Table 1. Sampling sites. Substrate types include G = Gravel, L = Leaf Litter, M = Mud, R = Rocks, S = Sand. Gear types include: C = Castnet, D = Dipnet, E = Backpack electroshocker, G = Gillnet, L = Trot Line, LS = Large Seine, SS = Small Seine, T = Trap.

Site #	Sampling events	Region	Coord. (X)	Coord. (Y)	river type*	Substrate†	Gear‡
1	1	Doumé	12.74488	−0.84800	Major river	S, M	D
2	2	Doumé	12.74448	−0.80551	Small river	G, M, L	D
3	3	Doumé	12.92636	−0.80776	Small river	M, S, L	D
4	4	Doumé	12.89150	−0.77313	Small river	S, R	SS
5	5	Doumé	12.91172	−0.77253	Small river	G, S, M, L	D
6	6, 7, 10, 14, 15, 16, 18	Doumé	12.98106	−0.75878	Small river	S, L	LS, SS, T
7	8	Doumé	13.12101	−0.74257	Small river	G, M, R, L	D
8	9	Doumé	13.02508	−0.74460	Small river	G, S, R, L	D
9	11, 12, 13	Doumé	12.99941	−0.74427	Small river	S, L	D, SS, LS
10	17	Doumé	12.76561	−0.66884	Small river	S, M, L	D
11	21, 23, 25, 29, 30, 33, 36, 38	Doumé	12.96249	−0.84245	Major river	S, R	G
12	34	Doumé	12.95582	−0.84177	Major river	S, R	LS
13	22, 24, 26, 31, 32, 35, 37	Doumé	12.96249	−0.84245	Major river	R, S	G
14	20, 27	Doumé	12.96249	−0.84245	Major river	S	LS
15	19, 39	Doumé	12.96363	−0.84189	Major river	S	LS, C
16	40	Doumé	12.96381	−0.84434	Small river	S, M	E
17	28, 44, 45	Doumé	12.86548	−0.84132	Major river	R	T, D
18	42, 47, 49	Doumé	12.96679	−0.84043	Major river	S, M	G
19	41	Doumé	12.97062	−0.89232	Major river	M, S	G
20	46, 48	Doumé	12.97062	−0.89232	Major river	S, L	G
21	43	Doumé	12.96582	−0.84146	Major river	R	C
22	51, 52, 53, 55, 56	Lelama	13.52629	−0.99385	Small river	M, S	D, G
23	50, 54	Lelama	13.52579	−0.99613	Small river	M, R	D, T
24	57, 62, 70	Lelama	13.35707	−0.934945	Major river	S	LS, SS
25	58, 63	Lelama	13.35732	−0.93568	Major river	S	G
26	59, 64, 66	Lelama	13.35707	−0.934945	Major river	S, M	G, L
27	60, 65	Lelama	13.35707	−0.934945	Major river	S, R	G
28	61, 68	Lelama	13.35707	−0.934945	Major river	R	T
29	67	Lelama	13.50984	−1.00853	Small river	M, L	E
30	69	Lelama	13.55104	−1.10777	Small river	R, S	E
31	71	Lelama	13.53217	−0.99832	Small river	M, L	E

*The small river category includes creeks and sloughs.
†Substrate types (listed in order of dominance): S = sand, G = gravel, R = rocks, M = mud, L = leaf litter.
‡Gear types: T = fish trap baited with earthworms, LS = large seine, SS = small seine, G = gill net, C = cast net, D = dip net, E = electroshocker, L = trot line.

is via train, or on timber roads within forestry concessions; thus, our sampling sites were partially determined by accessibility.

Data collection. Sampling methods included: electrofishing, trapping, gill netting, dip netting, seine netting, and cast netting (Fig. 3). In large rivers (width >20 m) including the Ogooué and Sébé, we sampled primarily with experimental gill nets deployed in slack-water areas. We opportunistically sampled along the banks with worm-baited traps, beach seines, and cast nets. In smaller rivers and streams, we sampled primarily with a backpack electroshocker (Halltech HT-2000 backpack electrofisher), but also used dip nets and seines (Table 1).

At each site, we recorded field data including: GPS coordinates (WGS84), date and time, stream width and depth, pH, conductivity, dissolved oxygen, temperature, turbidity, substrate type, and general notes. We report a subset of these data herein, and complete locality records can be obtained from the Oregon State Ichthyology Collection's database at https://ichthyology.oregonstate.edu or requested from its curator (BLS).

After capture, specimens were euthanized with an overdose of the anesthetic MS-222 (tricaine methanesulfonate) in accordance with recommended guidelines for the use of fishes in research (Jenkins et al. 2014). After euthanization, tissue samples were taken from a subset of vouchered specimens and preserved in 95% ethanol, and photographs of coloration immediately post-mortem were taken in in an immersion aquarium with the specimen positioned between two panes of glass following the procedure of Sabaj Perez (2009). Electric organ discharges (EODs) of mormyrid fishes were recorded in small aquaria with water from their collection site, using an Echo 2 USB analog to digital converter sampling at 192 kHz/16 bits. Specimen were fixed in 10% formalin, and later transferred to 50% isopropanol or 70% ethanol for long-term preservation. All specimens were provisionally identified on the day of capture.

Field identifications for all specimens accessioned into the OS collection were verified in 2015 and 2016 by team members JSC, JHMB, and BLS using the keys in Stiassny et al. (2007), while taking subsequent species descriptions and revisions into account (e.g. within *Hepsetus*, *Notoglanidium*, *Nannopetersius*, and *Labeobarbus* (Wamuini Lunkayilakio and Vreven 2008; Decru

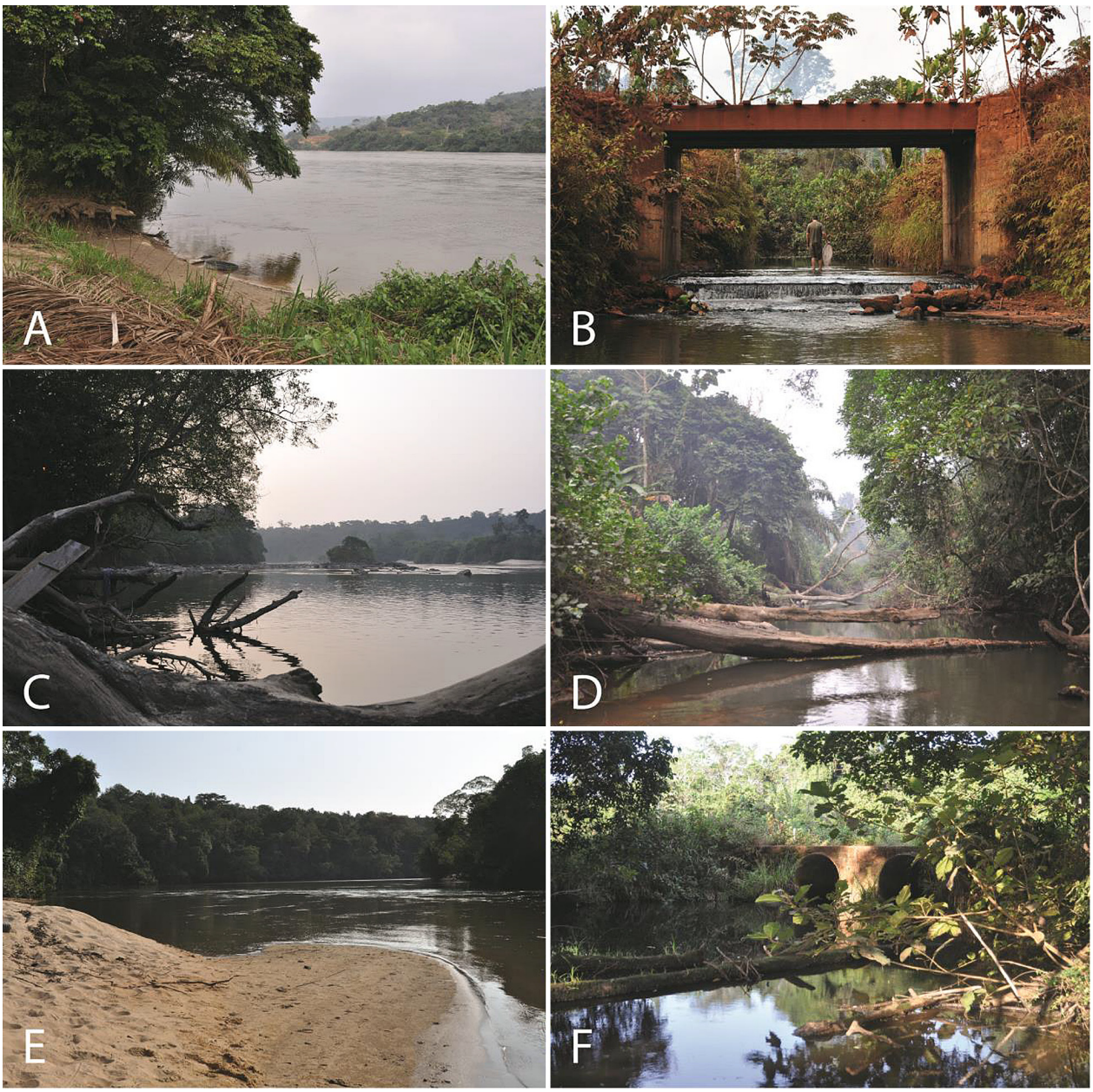

Figure 2. Collection localities. **A.** Site 1, Ogooué River at Lastoursville. **B.** Site 4, Bakoussou Creek. **C.** Site 15, Ogooué River at Doumé. **D.** Site 6, Moumba Creek. **E.** Site 24, Sébé River. **F.** Site 30, Lewogo Creek.

et al. 2013; Geerinckx et al. 2013; Vreven et al. 2016). All mormyrid specimens deposited into the CUMV were identified by JPS, and EOD recordings are now archived at the Macaulay Library at Cornell (https://www.macaulaylibrary.org/).

All collection and exportation of specimens occurred with the permission of the Gabonese Ministry of Scientific Research [Permit # AR0036 14/MESRS/CENAREST/CG/CST/CSAR (28 August 2014)]. As required by the Gabonese government, half of each specimen series was retained in Gabon and the remainder exported. Vouchers were deposited at Oregon State University (OS, general collections) and the Cornell University Museum of Vertebrates (CUMV, mormyrids), with basic data listed in Table 2, and full data accessible at http://ichthyology.oregonstate.edu/home, and http://www.cumv.cornell.edu/fishes.html or at http://www.fishnet2.net. Small juvenile or damaged specimens that could not be identified to species level are not included as distinct taxa in that list, and "sp." designations represent probable undescribed species. Some specimens of killifishes and mastacebelid eels were exported to J.F. Agnèse in France for molecular analyses, and field identifications could not be verified for those specimens.

Taxonomic nomenclature used in this publication follows Eschmeyer's Catalogue of Fishes (Eschmeyer et al. 2018). Three-character codes for the undescribed species of the mormyrid genus *Paramormyrops* follow Sullivan et al. (2002, 2004). Morphological diagnoses for all other species (except those potentially new to science) appear in Stiassny et al. (2007); Decru et al. (2013), and Geerinckx et al. (2013).

Figure 3. Sampling Equipment. **A.** Halltech HT-2000 backpack electroshocker and dip net. **B.** Bicycle wheel dip net. **C.** Trap. **D.** Seine net. **E.** Cast net. **F.** Gill net.

Results

We sampled 31 sites and collected 2,634 fishes, representing a minimum of 97 distinct species in 18 families and nine orders (Table 2). The most species-rich orders of fishes were the Siluriformes (23 spp.), Characiformes (22 spp.), and Osteoglossiformes (22 spp.), followed by Cypriniformes (14 spp.). The three most numerically abundant species were all cypriniforms, *Enteromius guirali* (431 individuals), *Enteromius brazzai* (246 individuals), and *Raiamas buchholzi* (148 individuals), followed by the siluriform *Chrysichthys nigrodigitatus* (128 individuals). The new genus and species *Cryptomyrus ogoouensis* Sullivan et al. 2016 (Fig. 4E) was described from specimens collected on this expedition, as was *Paramormyrops ntotom* (Rich et al. 2017). Seven other species in the collection are potentially new to science (Figs 4, 5), these are discussed first in the list below. These include three undescribed *Paramormyrops*, two species of *Plataplochilus*, an enigmatic alestid species tentatively assigned to *Phenacogrammus*, and a dwarf *Enteromius* that is either a new species or an aberrant color morph of *Enteromius jae*. After discussing the new or potentially new species collected on this expedition, we discuss some of the other species collected. A full list of species and specimens collected on this expedition is available in Table 2.

***Paramormyrops "BN2"* (Sullivan et al., 2002)**

Material examined. GABON • 1 male, 113 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98120. • 1 female, 108 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98118. • 1 female, 108 mm; Moum-

Table 2. List of species collected on this expedition organized by taxonomic group.

ORDER, family, species	Total spec.	Station #	Gear	Small river, Doumé	Major river, Doumé	Small river, Sébé	Major river, Sébé	Voucher #
ANABANTIFORMES								
Anabantidae								
Ctenopoma kingsleyae (Günther, 1896)	8	9, 20	T, GN	X	X			OS19587
CHARACIFORMES								
Alestidae								
Bryconalestes intermedius (Boulenger, 1903)	6	30	E,			X		OS 19688
Brycinus kingsleyae (Günther, 1896)	10	1, 14, 15, 21	D, LS, CN	X	x			OS19689, OS19690, OS19691
Brycinus macrolepidotus (Valenciennes, 1850)	21	1, 2, 6, 11, 14, 25	D, LS, GN	X	X		X	OS19682, OS19683, OS19684, OS19685, OS19686
Brycinus opisthotaenia (Boulenger, 1903)	42	2, 9, 11, 13, 15, 19, 20, 21, 22, 24, 26,	D, LS, GN, CN,	X	X	X	X	OS19700, OS19701, OS19702, OS19703, OS19704, OS19705, OS19706, OS19707, OS19708, OS19863
Brycinus taeniurus (Günther, 1867)	82	1, 9, 11, 13, 14, 19, 24, 25	D, LS, GN, SS	X	X		X	OS19398, OS19692, OS19693, OS19694, OS19695, OS19696, OS19697, OS19698, OS19699
Bryconaethiops macrops (Boulenger, 1920)	1	27	GN			X		OS 19687
Bryconaethiops microstoma (Günther, 1873)	65	9, 11, 12, 13, 15, 21, 24, 25, 26, 27	LS, GN, CN, SS	X	X		X	OS19663, OS19664, OS19665, OS19666, OS19667, OS19668, OS19669, OS19670, OS19671, OS19672, OS19673, OS19674, OS19675, OS19676, OS19677, OS19678, OS19881, OS19996
Bryconalestes longipinnis (Günther, 1864)	96	2, 5, 6, 9, 11, 12, 13, 14, 15, 21, 22, 24	D, LS, SS, GN, CN,	X	X	X	X	OS19391, OS19392, OS19393, OS19394, OS19395, OS19396, OS19397, OS19412, OS19413, OS19414, OS19415, OS19416, OS19417, OS19418, OS19419, OS19420, OS19421, OS19422, OS19423, OS19424, OS19425, OS19871
Nannopetersius ansorgii (Boulenger, 1910)	4	21	CN		X			OS19722, OS19723
Nannopetersius lamberti (Poll, 1967)	93	2, 6, 9, 11, 13, 15, 21, 26	D, LS, GN, CN,	X	X		X	OS19709, OS19710, OS19711, OS19712, OS19713, OS19714, OS19715, OS19875
Phenacogrammus aurantiacus (Pellegrin, 1930)	1	2	D	X				OS19717
Phenacogrammus urotaenia (Boulenger, 1909)	3	3	D	X				OS19718, OS19719
Phenacogrammus sp.	4	21	CN		X			OS19716
Distichodontidae								
Distichodus hypostomatus (Pellegrin, 1900)	13	4, 9, 21, 25, 30	SS, LS, CN, GN, E	X	X	X	X	OS19518, OS19523, OS19526, OS19540, OS19541, OS19542, OS19876
Distichodus notospilus (Günther, 1867)	14	11, 13, 22, 23, 27	GN, D, T,		X	X	X	OS19514, OS19527, OS19529, OS19543, OS19544
Monistichodus elongatus (Pellegrin, 1900)	25	2, 6, 12, 20	D, LS, GN	X	X			OS19516, OS19522, OS19525, OS19545, OS19546, S19547,
Nannocharax intermedius (Boulenger, 1903)	1	6	LS	X				OS19724
Nannocharax parvus (Pellegrin, 1906)	1	22	D			X		OS19519
Neolebias trewavasae (Poll & Gosse, 1963)	67	22, 29, 31	D, E			X		OS19513, OS19520, OS19740, OS19743, OS19745, OS19746, OS19747, OS19818, OS19819, OS19820, OS19821, OS19824, OS19848, OS19849, OS19851, OS19856, OS19858, OS19893
Xenocharax spilurus (Günther, 1867)	21	2, 6, 11, 14, 21, 26, 27	D, LS, GN, CN	X	X		X	OS19515, OS19521, OS19524, OS19528, OS19548, OS19884
Hepsetidae								
Hepsetus kingsleyae (Vreven, Decru & Snoeks, 2013)	1	11	GN		X			OS19572
Hepsetus lineatus (Pellegrin, 1926)	12	7, 22, 27, 31	GN, D, E	X		X	X	OS19832, OS19864, OS19868, OS19880, OS19615, OS19616
CLUPEIFORMES								
Clupeidae								
Pellonula vorax (Günther, 1868)	2	11, 13	GN		X			OS 19621

ORDER, family, species	Total spec.	Station #	Gear	Small river, Doumé	Major river, Doumé	Small river, Sébé	Major river, Sébé	Voucher #
CYPRINIFORMES								
Cyprinidae								
Enteromius sp.	4	29	E			X		OS19399
Enteromius brazzai (Pellegrin, 1901)	246	2, 11, 14, 15, 21, 24, 27, 29	D, LS, GN, CN, E	X	X		X	OS19533, OS19534, OS19535, OS19536, OS19537, OS19538, OS19539, OS19798, OS19800
Enteromius camptacanthus (Bleeker, 1863)	18	2, 8, 29, 31	D, E	X		X		OS19430, OS19431, OS19432, OS19433, OS19892, OS19894
Enteromius guirali (Thominot, 1886)	431	1, 2, 5, 6, 8, 9, 11, 13, 14, 15, 17, 22, 23, 24, 25, 27, 28, 29, 30, 31	D, LS, GN, T, E, SS	X	X	X	X	OS19549, OS19552, OS19553, OS19554, OS19555, OS19556, OS19557, OS19558, OS19560, OS19561, OS19562, OS19563, OS19564, OS19565, OS19566, OS19567, OS19568, OS19569, OS19570, OS19571, OS19583, OS19620, OS19728, OS19730, OS19802, OS19865, OS19866, OS19872, OS19873, OS19896
Enteromius holotaenia (Boulenger, 1902)	51	3, 11, 13, 14, 15, 17, 20, 21, 24, 27, 29	D, LS, GN, CN, E, SS	X	X	X	X	OS19434, OS19435, OS19436, OS19437, OS19726, OS19732
Enteromius jae (Boulenger, 1903)	76	29, 31	E			X		OS19403, OS19404, OS19405, OS19406, OS19407, OS19408, OS19409, OS19410 OS19411
Enteromius martorelli (Roman, 1971)	3	3, 21	D, CN	X	X			OS19428, OS19429
Enteromius prionacanthus (Mahnert & Géry, 1982	34	2, 3, 5, 12, 22, 24, 27, 29	D, LS, GN, E	X	X	X	X	OS19390, OS19438, OS19439, OS19440, OS19441, OS19442, OS19443, OS19444, OS19799
Enteromius trispilomimus (Boulenger, 1907)	1	24	LS,				X	OS19426
Labeo annectens (Boulenger, 1903)	6	6, 11, 13, 21	LS, GN, CN	X	X			OS19389, OS19445, OS19446, OS19517
Labeobarbus malacanthus (Pappenheim, 1911)	1	21	CN		X			OS19550
Labeobarbus progenys (Boulenger, 1903)	3	22, 25	GN			X	X	OS19888
Opsaridium ubangiense (Pellegrin, 1901)	8	6, 9	LS	X	X			OS19447, OS19448
Raiamas buchholzi (Peters, 1876)	148	1, 2, 6, 9, 11, 12, 13, 14, 15, 17, 19, 21, 24, 30	D, LS, GN, CN, E, SS	X	X	X	X	OS19379, OS19380, OS19381, OS19384, OS19385, OS19386, OS19387, OS19449, OS19450, OS19451, OS19452, OS19453, OS19454, OS19456, OS19457, OS19458, OS19727
CYPRINODONTIFORMES								
Nothobranchiidae								
Aphyosemion cyanostictum (Lambert & Géry, 1968)	4	29	E			X		OS19803, OS19823, OS19852, OS19854
Aphyosemion lamberti (Radda & Huber, 1977)	36	6, 16, 27	SS, E	X	X		X	OS19733, OS19734, OS19735, OS19736
Epiplatys neumanni (Berkenkamp, 1993)	3	29	E			X		OS19822
Poeciliidae								
Plataplochilus sp. *1*	94	1, 2, 3, 5, 6, 8, 10	D, LS	X	X			OS19378
Plataplochilus sp. *2*	94	22, 29, 30, 31	D, E			X		OS19739, OS19741, OS19742, OS19744, OS19850, OS19857, OS19904
OSTEOGLOSSIFORMES								
Mormyridae								
Brienomyrus brachyistius (Gill, 1862)	3	6	T	X				CUMV98082, CUMV98111, CUMV98112
Cryptomyrus ogoouensis (Sullivan, Lavoué & Hopkins, 2016)	1	17	T		X			CUMV98155
Ivindomyrus marchei (Sauvage, 1879)	8	25, 28	T, GN				X	CUMV98171, CUMV98172, CUMV98173, CUMV98174, CUMV98175, CUMV98176
Marcusenius moorii (Günther, 1867)	64	5, 6, 14, 17, 23, 27, 28, 31	T, LS, GN, E, D	X	X	X	X	OS19370, OS19372, OS19373, OS19374, CUMV98085, CUMV98124, CUMV98145, CUMV98146, CUMV98147, CUMV98170, CUMV98183, CUMV98184
Mormyrops nigricans (Boulenger, 1899)	1	17	T		X			CUMV98148
Mormyrops zanclirostris (Günther, 1867)	18	5, 6, 28	D, T	X			X	CUMV98096, CUMV98181, CUMV98182

ORDER, family, species	Total spec.	Station #	Gear	Small river, Doumé	Major river, Doumé	Small river, Sébé	Major river, Sébé	Voucher #
Paramormyrops sp.	1	10	D	X				CUMV98201
Paramormyrops sphekodes (Sauvage, 1879)	8	17, 21, 28	T		X			CUMV98177, CUMV98154, CUMV98161, CUMV98153, CUMV98159, CUMV98160, CUMV98152, CUMV98162
Paramormyrops sp. *"MAG"*	12	2, 6, 28	D, T	X			X	CUMV98075, CUMV98100, CUMV98113, CUMV98114, CUMV98115, CUMV98116, CUMV98117, CUMV98121, CUMV98163, CUMV98164, CUMV98178, CUMV98180
Paramormyrops ntotom (Rich, Sullivan & Hopkins, 2016)	34	17, 28	T		X		X	CUMV98091, CUMV98077, CUMV98078, CUMV98079, CUMV98080, CUMV98081, CUMV98086, CUMV98087, CUMV98088, CUMV98089, CUMV98090, CUMV98092, CUMV98127, CUMV98128, CUMV98129, CUMV98130, CUMV98131, CUMV98132, CUMV98133, CUMV98134, CUMV98135, CUMV98136, CUMV98137, CUMV98138, CUMV98139, CUMV98140, CUMV98141, CUMV98142, CUMV98143, CUMV98144, CUMV98261, CUMV98551
Paramormyrops sp. *"OFF"*	9	17, 28	T		X		X	CUMV98150, CUMV98149, CUMV98151, CUMV98165, CUMV98166, CUMV98167, CUMV98168, CUMV98169, CUMV98179
Paramormyrops sp. *"SN7"*	23	6	T, LS	X				CUMV98103, CUMV98102, CUMV98104, CUMV98105, CUMV98106, CUMV98107, CUMV98108, CUMV98109, CUMV98110, CUMV98156, CUMV98157, CUMV98198, CUMV98199, CUMV98202, CUMV98203, CUMV98204, CUMV98205, CUMV98206, CUMV98207
Paramormyrops batesii (Boulenger, 1906)	19	5, 6, 31	D, T, E	X		X		CUMV98093, CUMV98094, CUMV98095, CUMV98097, CUMV98098, CUMV98099, CUMV98185, CUMV98186, CUMV98187, CUMV98188, CUMV98189, CUMV98190, CUMV98191, CUMV98192, CUMV98193, CUMV98194, CUMV98195, CUMV98196, CUMV98197
Paramormyrops sp. *"BN2"*	7	6	T, LS	X				CUMV98101, CUMV98118, CUMV98119, CUMV98120, CUMV98125, CUMV98126
Petrocephalus microphthalmus (Pellegrin, 1909)	8	6, 24, 25, 26, 27	LS, GN	X		X	x	OS19371, OS19375, CUMV98158, CUMV98200
Petrocephalus simus (Sauvage, 1879)	4	2, 11, 14	D, LS, GN	X	X			OS19388
Petrocephalus sullivani (Lavoué, Hopkins & Kamdem Toham, 2004)	4	6, 14	LS	X	X			CUMV98076, CUMV98083, CUMV98084, CUMV98122, CUMV98123
Stomatorhinus walkeri (Günther, 1867)	7	2, 5, 6	D, T	X				OS19376, OS19377, CUMV98084, CUMV98122, CUMV98076, CUMV98123, CUMV98083
Notopteridae								
Xenomystus nigri (Günther, 1868)	1	26	GN				X	OS19890
PERCIFORMES								
Cichlidae								
Chromidotilapia kingsleyae (Boulenger, 1898)	24	2, 5, 6, 9, 11, 30	D, LS, SS, GN, E	X	X		X	OS19591, OS19592, OS19593, OS19594, OS19595, OS19596
Chromidotilapia regani (Pellegrin, 1906)	2	6	LS	X				OS19584, OS19585
Coptodon tholloni (Sauvage, 1884)	93	2, 6, 11, 12, 14, 15, 21	D, LS, SS, GN, CN	X	X			OS19607, OS19608, OS19609, OS19610, OS19611, OS19612, OS19613, OS19614
Divandu albimarginatus (Lamboj & Snoeks, 2000)	1	11	GN		X			OS19586
Hemichromis elongatus (Guichenot, 1861)	38	1, 2, 3, 6, 8, 10, 11, 12, 14, 22, 30, 31		X	X	X	X	OS19573, OS19574, OS19575, OS19576, OS19577, OS19578, OS19579, OS19580, OS19581, OS19582, OS19867
Hemichromis stellifer (Loiselle, 1979)	3	2	D	X				OS19588, OS19589, OS19590
Oreochromis schwebischi (Sauvage, 1884)	45	11, 15, 21, 24, 25	CN, LS, GN, SS		X		X	OS19597, 0S19598, OS19599, OS19600, OS19601, OS19602, OS19603, OS19604, OS19605, OS19606

ORDER, family, species	Total spec.	Station #	Gear	Small river, Doumé	Major river, Doumé	Small river, Sébé	Major river, Sébé	Voucher #
Pelmatolapia cabrae (Boulenger, 1899)	12	2, 9, 15, 21	D, LS, CN	X	X			OS19617, OS19618, OS19619
SILURIFORMES								
Amphiliidae								
Amphilius nigricaudatus (Pellegrin, 1909)	24	2, 3, 4, 6, 10, 29, 30, 31	D, SS, LS, E	X		X		OS19658, OS19659, OS19660, OS19661, OS19898, OS19901
Phractura brevicauda (Boulenger, 1911)	9	3, 30	D, E	X		X		OS19645, OS19646, OS19647, OS19855
Phractura longicauda (Boulenger, 1903)	15	2, 9, 30	D, E	X		X		OS19656
Claroteidae								
Chrysichthys nigrodigitatus (Lacepède, 1803)	128	2, 6, 9, 11, 13, 14, 15, 20, 21, 24, 31	D, LS, SS, GN, CN, E	X	X	X	X	OS19530, OS19531, 0S19626, OS19627, OS19628, OS19629, OS19630, OS19631, OS19632, OS19533
Chrysichthys ogooensis (Pellegrin, 1900)	53	15	LS		X			OS19657
Chrysichthys thysi (Risch, 1985)	6	11	GN,		X		X	OS19642, OS19643, OS19644
Notoglanidium macrostoma (Pellegrin, 1909)	2	31	E			X		OS19853
Parauchenoglanis punctatus (Boulenger, 1902)	5	2, 19, 23	D, GN, T	X	X	X		OS19427, OS19532, OS19655, OS19869, OS19870
Clariidae								
Clarias buthupogon (Sauvage, 1879)	3	6	SS	X				OS19649
Clarias camerunensis (Lönnberg, 1895)	3	29	E			X		OS19895
Clarias jaensis (Boulenger, 1909)	5	2, 30	D, E	X		X		OS19899, OS19650
Clarias pachynema (Boulenger, 1903)	2	5	D		X			OS19651
Clarias platycephalus (Boulenger, 1902)	1	6	LS	X				OS19652
Clarias submarginatus (Peters, 1882)	3	27	GN				X	OS19653
Malapteruridae								
Malapterurus oguensis (Sauvage, 1879)	1	31	E			X		OS19903
Mochokidae								
Atopochilus savorgnani (Sauvage, 1879)	1	4	SS	X				OS19648
Chiloglanis cameronensis (Boulenger, 1904)	1	6	LS	X				OS19662
Synodontis batesii (Boulenger, 1907)	14	6, 9, 22, 23, 30	D, SS, LS, T, E	X		X		OS19639, OS19640, OS19641 OS19874
Synodontis tessmanni (Pappenheim, 1911)	1	27	GN				X	OS19910
Schilbeidae								
Parailia occidentalis (Pellegrin, 1901)	3	6, 9, 17	LS, SS, D	X	X			OS19725
Pareutropius debauwi (Boulenger, 1900)	44	1, 6, 11, 13, 17, 21, 24, 25, 27	D, LS, GN, CN, SS	x	x		x	OS19634, OS19635, OS19636, OS19637, OS19638, OS19654, OS19729, OS19731
Schilbe grenfelli (Boulenger, 1900)	11	11, 13, 25, 27	GN	X			X	OS19551, OS19622, OS19623, OS19624, OS19625, OS19995
Schilbe multitaeniatus (Pellegrin, 1913)	10	11, 13, 24, 25, 27	GN, SS		X		X	OS19889, OS19878, OS19877
SYNBRANCHIFORMES								
Mastacembelidae								
Mastacembelus marchei (Sauvage, 1879)	1	30	E			X		OS19900
Mastacembelus niger (Sauvage, 1879)	26	6, 28, 29, 30, 31	LS, T, E	X		X	X	OS19902, OS19897, OS19891, OS19369

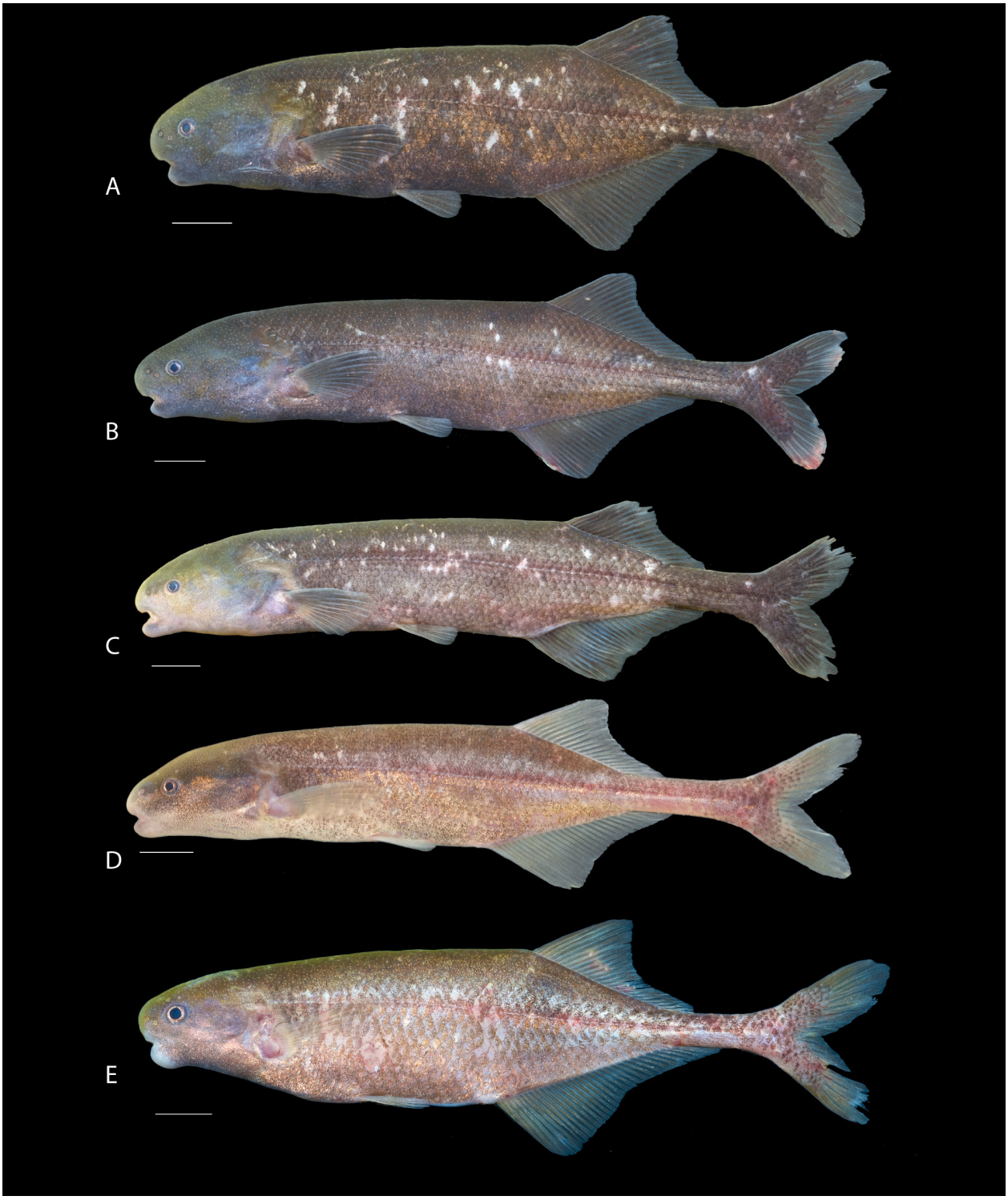

Figure 4. Undescribed species of Mormyridae collected on this expedition. **A.** *Paramormyrops* "BN2", SL = 108 mm, euthanized. **B.** *Paramormyrops* "SN7", SL = 124 mm, euthanized. **C.** *Paramormyrops* "MAG", SL = 133mm, euthanized. **D.** *Paramormyrops* "OFF", SL = 126 mm, euthanized. **E.** *Cryptomyrus ogoouensis,* SL = 116 mm, euthanized.

ba creek; −0.7587, 12.9810; 14 Sep. 2014; John P. Sullivan, Joseph Cutler leg.; CUMV98126. • 1 female, 105 mm; Moumba creek; −0.7587, 12.9810; 14 Sep. 2014; John P. Sullivan, Joseph S. Cutler leg.; CUMV98125. • 1 female, 100 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98119. • 1 male, 92 mm; Moumba creek; −0.7587, 12.9810; 12 Sep. 2014; John P. Sullivan leg.; CUMV98101. Table 2, Figure 4A.

Identification. This is a blunt-snouted, smaller species of *Paramormyrops* with a maximum adult size of 110 mm SL. It has a very short EOD (<0.4 ms) with a very small head-positive first phase, followed by a much larger head-negative second phase.

Paramormyrops "SN7" (Sullivan et al., 2002)

Material examined. GABON • 1 male, 148 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; John P. Sul-

Figure 5. Potentially undescribed species collected on this expedition. **A**. *Plataplochilus* sp. 1, SL = 24.9 mm, euthanized, photographed on black background. **B.** *Plataplochilus* sp. 2, SL = 28.56 mm, euthanized, photographed on white background. **C.** *Enteromius* cf. *jae*, SL = 22.57 mm, euthanized. **D.** cf. *Phenacogrammus*, SL = 60.36 mm, preserved.

livan leg.; CUMV98104. • 1 male, 143 mm; Moumba creek; −0.7587, 12.9810; 12 Sep. 2014; John P. Sullivan leg.; CUMV98103. • 1 male, 142 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98108. • 1 male, 140 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98105. • 1 male, 132 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98106. • 1 male, 127 mm; Moumba creek; −0.7587, 12.9810; 14 Sep. 2014; John P. Sullivan, Joseph S. Cutler leg.; CUMV98156. • 1 male, 126 mm; Moumba creek; −0.7587, 12.9810; 14 Sep. 2014; John P. Sul-

livan, Joseph S. Cutler leg.; CUMV98202. • 1 female, 124 mm; Moumba creek; −0.7587, 12.9810; 14 Sep. 2014; John P. Sullivan, Joseph S. Cutler leg.; CUMV98204. • 1 female, 124 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; CUMV98198. • 1 female, 122 mm; Moumba creek; −0.7587, 12.9810; 14 Sep. 2014; John P. Sullivan, Joseph S. Cutler leg.; CUMV98157. • 1 male, 122 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98107. • 1 female, 114 mm; Moumba creek; −0.7587, 12.9810; 12 Sep. 2014; John P. Sullivan leg.; CUMV98102. • 1 male, 113 mm; Moumba creek; −0.7587, 12.9810; 14 Sep. 2014; John P. Sullivan, Joseph S. Cutler leg.; CUMV98206. • 1 female, 113 mm; Moumba creek; −0.7587, 12.9810; 14 Sep. 2014; John P. Sullivan, Joseph S. Cutler leg.; CUMV98207. • 1 female, 112mm; Moumba creek; −0.7587, 12.9810; 14 Sep. 2014; John P. Sullivan, Joseph S. Cutler leg.; CUMV98205. • 1 female, 110 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98110. • 1 female, 105 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98109. • 1 female, 103 mm; Moumba creek; −0.7587, 12.9810; 14 Sep. 2014; John P. Sullivan, Joseph S. Cutler leg.; CUMV98203. • 1, 96 mm; Moumba creek; −0.7587, 12.9810; 13 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; CUMV98199. Table 2, Figure 4B.

Identification. This species has a sharp snout in dorsal view which protrudes beyond a sub-inferior mouth below. Its EOD is biphasic with a head-positive first phase approximately 1.8 ms in duration, with a smoothly concave rising slope. There is no head-negative pre-pulse. The second, head-negative phase is of lower amplitude and much shorter duration.

Paramormyrops "MAG" (Sullivan et al., 2002)

Material examined. GABON • 1 male, 150 mm; Sébé River, rocky outcrop below bridge, left bank; −0.9344, 13.3577; 22 Sep. 2014; John P. Sullivan, Joseph S. Cutler, Alain Dole leg.; CUMV98178. • 1 female, 137 mm; Sébé River, rocky outcrop below bridge, left bank; −0.9344, 13.3577; 22 Sep. 2014; John P. Sullivan, Joseph S. Cutler, Alain Dole leg.; CUMV98180. • 1 female, 136 mm; Sébé River, rocky outcrop below bridge, left bank; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98164. • 1 male, 133 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98115. • 1 male, 133 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98113. • 1 female, 126 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98114. • 1 female, 117 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98117. • 1 female, 115 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 14 Sep. 2014; John P. Sullivan, Joseph S. Cutler leg.; CUMV98121. • 1 female, 114 mm; Sébé River, rocky outcrop below bridge, left bank; −0.934422, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98163. • 1 male, 109 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98116. • 1 female, 94 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 11 Sep. 2014; John P. Sullivan leg.; CUMV98100. • 1, 44 mm; Mokuma Creek, small stream nearby Hotel Escale, Lastourville; −0.8055, 12.7444; 17 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; CUMV98075. Table 2, Figure 4C.

Identification. *Paramormyrops "MAG"* is distinctive due to its very sharp snout (in dorsal view) and small eye. This is one of the few species in which different EOD types are apparent within single populations (Arnegard et al. 2005). Three EOD types have been described in adults; those in our collections correspond to Types I and III. In Type I, the negative first phase is immediately followed by a head positive pulse of near equal amplitude, followed by a small head-negative dip. The total EOD duration is about 1 millisecond. Type II EODs are longer in total duration about 1.2 milliseconds, as the first negative phase is shallower and slowly rises before onset of the head-positive second phase.

Paramormyrops "OFF" (Sullivan et al., 2002)

Material examined. GABON • 1 male, 71 mm; Ogooué River in front of Doumé Village; −0.8413, 12.9654; 17 Sep. 2014; John P. Sullivan, Brian L. Sidlauskas leg.; CUMV98149. • 1 male, 165 mm; Sébé River, rocky outcrop below bridge, left bank; −0.934422, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98168. • 1 female, 163 mm; Ogooué River in front of Doumé Village; −0.8413, 12.9654; 17 Sep. 2014; John P. Sullivan, Brian L. Sidlauskas leg.; CUMV98151. • 1 male, 151 mm; Sébé River, rocky outcrop below bridge, left bank; −0.934422, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98169. • 1 male, 144 mm; Ogooué River in front of Doumé Village; −0.8413, 12.9654; 17 Sep. 2014; John P. Sullivan, Brian L. Sidlauskas leg.; CUMV98150. • 1 male, 134 mm; Sébé River, rocky outcrop below bridge, left bank; −0.934422, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98167. • 1 female, 134 mm; Sébé River, rocky outcrop below bridge, left bank; −0.934422, 13.3577; 22 Sep. 2014; John P. Sullivan, Marie−Claire Paiz, Alain Dole leg.; CUMV98179. • 1 male, 133 mm; Sébé River, rocky outcrop below bridge, left bank; −0.934422, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98165. • 1 female, 126 mm; Sébé River, rocky outcrop below bridge, left bank; −0.934422, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98166. Table 2, Figure 4D.

Identification. *Paramormyrops "OFF"* is a large species (reaching standard length >150 mm) It is similar to *Paramormyrops longicaudatus* of the Ivindo River of Gabon, albeit with a shorter caudal peduncle. *Paramormyrops "OFF"* have bicuspid teeth, with five in the upper jaw and six in the lower jaw. The species has a sharp snout with a somewhat conical head and no submental swelling. It has a biphasic EOD with an initial head-positive peak followed by a head-negative peak. There is no head-negative pre-pulse. The initial phase of the EOD is head-positive and follows a straight rise to an inflection point near the peak; the second negative phase of the EOD is nearly equal in amplitude but shorter than the first phase, at least in females. In males, the second phase is extended. Total EOD duration 2.7–3 milliseconds.

***Cryptomyrus ogoouensis* (Sullivan et al., 2016)**

Material examined. GABON • 1 female, 116 mm; Ogooué River in front of Doumé Village; −0.8413, 12.9654; 17 Sep. 2014; John P. Sullivan, Brian L. Sidlauskas leg.; CUMV98155. Table 2, Figure 4E.

Identification. Generally, *Cryptomyrus* have few mid-lateral scales (44 or 45 lateral line scales), and 12 circumpeduncular scales. Very few other mormyrids have so few lateral line scales (only *Marcusenius, Pollimyrus*, and *Stomatorhinus* are similar), and *Cryptomyrus* can be distinguished from these by the shape of the chin. *Cryptomyrus* have a moderately swollen chin (much larger than that of *Pollimyrus* and *Stomatorhinus*), but it does not protrude beyond the tip of the snout (as it does in *Marcusenius*). The EOD waveform of the specimen from Doumé is triphasic and very brief, dissimilar to that of every other species recorded so far in Gabon (Sullivan et al. 2016). *Cryptomyrus ogoouensis* can be distinguished from its sole congener (*C. ona*) in that *C. ogoouensis* has 24 dorsal fin rays and 30 anal fin rays, whereas *C. ona* has 20 or 21 and 24 or 25, respectively. Furthermore in *C. ogoouensis* the anal fin is longer and begins well in advance of the dorsal fin origin. *Cryptomyrus ona* was described from two specimens collected in the Nyanga and Ngounié rivers, whereas the sole specimen of *C. ogoouensis* was collected on the Ogooué mainstem directly below the falls at Doumé.

***Plataplochilus* sp. 1**

Material examined. GABON • 1 male, 24.9 mm; Ogooué River at Hotel Escale de l'Ogooué, Lastoursville; −0.8080, 12.7448; 7 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19378. Table 2, Figure 5A.

Identification. On this expedition we collected two distinct species of *Plataplochilus* that posed taxonomic difficulty. With a tubular supraorbital canal with four large pores these specimens clearly key to the genus *Plataplochilus*, but species level identification has been challenging. According to the literature there are eight recognized species, of which only *P. terveri* was known previously from the region, but *P. terveri* is not a morphological match for either species we collected (Stiassny et al. 2007). The taxonomy of the genus *Plataplochilus* is poorly resolved and several new species are in the process of being described by J.F. Agnèse, L. Chirio, and colleagues. Specimens collected during this expedition have been send to that lab to be included in the taxonomic revision. *Plataplochilus* sp. 1 is a medium-sized species with a pointed snout and dorsal caudal fin ray extensions. *Plataplochilus* sp. 1 can be distinguished from *P. miltotaenia, P. pulcher*, and *P. mimus* because *P.* sp. 1 lacks a red mid-lateral line. *Plataplochilus* sp. 1 can be distinguished from *P. terveri* because *P. terveri* lacks fin extensions. *Plataplochilus loemensis* has a D/A position of 4–6, rather than 7–9 present in *P.* sp. 1. *Plataplochilus chalcopyrus* can be distinguished from *P.* sp. 1 as its D/A is 9–10 and it has a large dark spot on caudal peduncle and base of caudal fin. The closest morphological matches for *P.* sp. 1, appear to be *P. cabindae* and *P. ngaensis*, but neither species is known to occur in the region. *Plataplochlius* sp. 1 is morphologically similar to *P. cabindae* but differs in eye color (*P. cabindae* has an orange eye whereas *P.* sp. 1 has a white eye). *Plataplochilus* sp. 1 is also morphologically similar to *P. ngaensis* but *P. ngaensis* has two broad bands on the posterior flank absent in the specimen we collected. *Plataplochilus* sp. 1 can be distinguished from *P.* sp. 2 by its color pattern, *P.* sp. 1 has bright iridescent blue flanks, red fin tips, and an uncolored eye, whereas *P.* sp. 2 has moderately blue flanks, yellow fins (with minimal red tips), and a blue eye.

***Plataplochilus* sp. 2**

Material examined. GABON • 1, 28.56 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 19 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19739. • 1, 25.6 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 19 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19742. • 1, 24.14 mm; small stream running behind forestry camp between camp and confluence with Lélama, Sébé drainage; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou leg.; OS19757. • 1, 21.3 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 19 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19744. • 1, 20.2 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 19 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19741. • 1, 16.31 mm; small stream running behind forestry camp between camp and confluence with Lélama, Sébé drainage; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou leg.; OS19750. • 1; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Brian L. Sidlauskas leg.; OS19904. Table 2, Figure 5B.

Identification. The specimens tentatively assigned to

Plataplochilus sp. 2 differ from all other described species of *Plataplochilus* in the Lower Guinea ichthyofaunal province. *Plataplochilus* sp. 2 is a medium-sized species with a pointed snout and dorsal caudal fin ray extensions, moderately blue flanks, yellow fins (with minimal red tips), and a blue eye. Only *Plataplochilus terveri* is known to occur in the region, but several characteristics distinguish *P.* sp. 2 from *P. terveri* including that *P. terveri* lack fin extensions. *Plataplochilus* sp. 2 can be distinguished from *P. miltotaenia, P. pulcher*, and *P. mimus* based on color pattern because *P.* sp 2 lacks a red mid-lateral line on the flanks. *Plataplochilus* sp. 2 can be distinguished from *P. loemensis* and *P. chalcopyrus* by relative fin position, D/A of 7–9 versus 4–6 and 9–10 (respectively). *Plataplochlius* sp. 2 is morphologically similar to *P. cabindae* but differs in eye color (*P. cabindae* has an orange eye, whereas *P.* sp. 2 has a blue eye). *Plataplochilus* sp. 2 is also morphologically similar to *P. ngaensis*, but *P. ngaensis* has two broad bands on the posterior flank absent in the specimen we collected. *Plataplochilus* sp. 2 and *P.* sp. 1 can be distinguished by color pattern; *P.* sp. 1 is much more brilliant than *P.* sp. 2 and has bright iridescent blue flanks, red fin tips, and an uncolored eye. *Plataplochilus* sp. 2 has moderately blue flanks, yellow fins (with minimal red tips), and a blue eye.

***Enteromius jae* (Boulenger, 1903)**

Material examined. GABON • 1, 24.1 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Brian L. Sidlauskas leg.; OS19408. • 1, 22.57 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Brian L. Sidlauskas leg.; OS19409. • 1, 21.92 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Brian L. Sidlauskas leg.; OS19410. GABON • 1, 21.9 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Brian L. Sidlauskas leg.; OS19411. • 1, 20.75 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Brian L. Sidlauskas leg.; OS19405. • 2, 19.4–20.3 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Brian L. Sidlauskas leg.; OS19403. • 1, 18.97 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Brian L. Sidlauskas leg.; OS19404. • 1, 18.77 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Brian L. Sidlauskas leg.; OS19406. • 1, 18.57 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Brian L. Sidlauskas leg.; OS19407. Table 2, Figs 5C, 12J.

Identification. This dwarf cyprinid species *Enteromius* jae can be separated from most other members of *Enteromius* by the combination of small body size (maximum TL <4 cm), the lack of barbels, terminal mouth, highly incomplete lateral line with no more than six perforated scales, a lack of spinous elements in the dorsal fin, a color pattern with multiple black dots and bars along the flanks with another at the dorsal fin origin, and only three simple rays in the dorsal fin (the very similar *Enteromius parajae* has four). Substantial variation in the number of dark bars occurs among individuals of *Enteromius jae*, which might represent sexual dimorphism, regional variation, or the presence of multiple species; however, there are normally at least three such bars. During this investigation, we caught barred specimens clearly identifiable as *Enteromius jae* (e.g. Fig. 12J) together with similarly sized individuals lacking bars and with no trace of banded melanophores on the flanks (e.g. OS19400, Fig. 4C). Aside from the difference in coloration, these specimens are morphologically similar. It is unclear whether these specimens lacking dark markings are conspecific with *Enteromius jae*, or whether they represent a new species.

***Phenacogrammus* sp.**

Material examined. GABON • 1, 60.36 mm; left bank of Ogooué River at Doumé above the rapids; −0.8414, 12.9658; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19716. Table 2, Figure 5D.

Identification. One alestid specimen in the collection (OS 19716) cannot be reliably identified to genus or species and appears to be intermediate between the current concepts of *Phenacogrammus* and *Brachypetersius*. It possesses an incomplete lateral line series (typically indicative of *Phenacogrammus*), but that series contains 21 pored scales (of 29 total in the series), which exceeds the maximum number in any species of that genus occurring in Lower Guinea by six (Paugy and Schaefer 2007). The number of upper transverse scales (5.5) is in the range of *Brachypetersius* (and not *Nannopetersius*), but the incomplete lateral line prevents assignation of the specimen to any known species in those genera. The specimen may represent a new species, a highly aberrant individual of a known species, or a range extension for a species not otherwise known to occur in the area. With only one specimen and no DNA sample, it is impossible to be certain.

***Amphilius nigricaudatus* (Pellegrin, 1909)**

Material examined. GABON • 1, 53.8 mm; small stream (Lewogo) in Lékoni drainage; −1.1077, 13.5510; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas leg.; OS19901. • 7, 33.97–53.41mm; small stream (Lewogo) in Lékoni drainage; −1.1077, 13.5510; 22 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh,

Brian L. Sidlauskas leg.; OS19658. • 1, 50.9 mm; small stream (Lewogo) in Lékoni drainage; −1.1077, 13.5510; 22 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas leg.; OS19898. • 1, 48.56 mm; Bakoussou stream at road R19 east of Lastoursville, Ogooué drainage; −0.7731, 12.891; 10 Sep. 2014; Colin Apse, Jean Hervé Mvé Beh, Brian L. Sidlauskas, Thibault Cavalier de Cuverville leg.; OS19659. • 1, 38.15 mm; stagnant river east of Lastoursville and south of road R19 near bridge, Ogooué drainage; −0.8077, 12.9263; 10 Sep. 2014; Colin Apse, Jean Hervé Mvé Beh, John P. Sullivan, Thibault Cavalier de Cuverville leg.; OS19660. • 1, 27.58 mm; stagnant river east of Lastoursville and south of road R19 near bridge, Ogooué drainage; −0.8077, 12.9263; 10 Sep. 2014; Colin Apse, Jean Hervé Mvé Beh, John P. Sullivan, Thibault Cavalier de Cuverville leg.; OS19661. Table 2, Figure 6A.

Identification. Eyes placed posteriorly on head. Pelvic fins behind dorsal fin. Caudal fin with 6+7 principle rays. Origin of dorsal fin more than one head length behind head. Caudal fin with large central black disk.

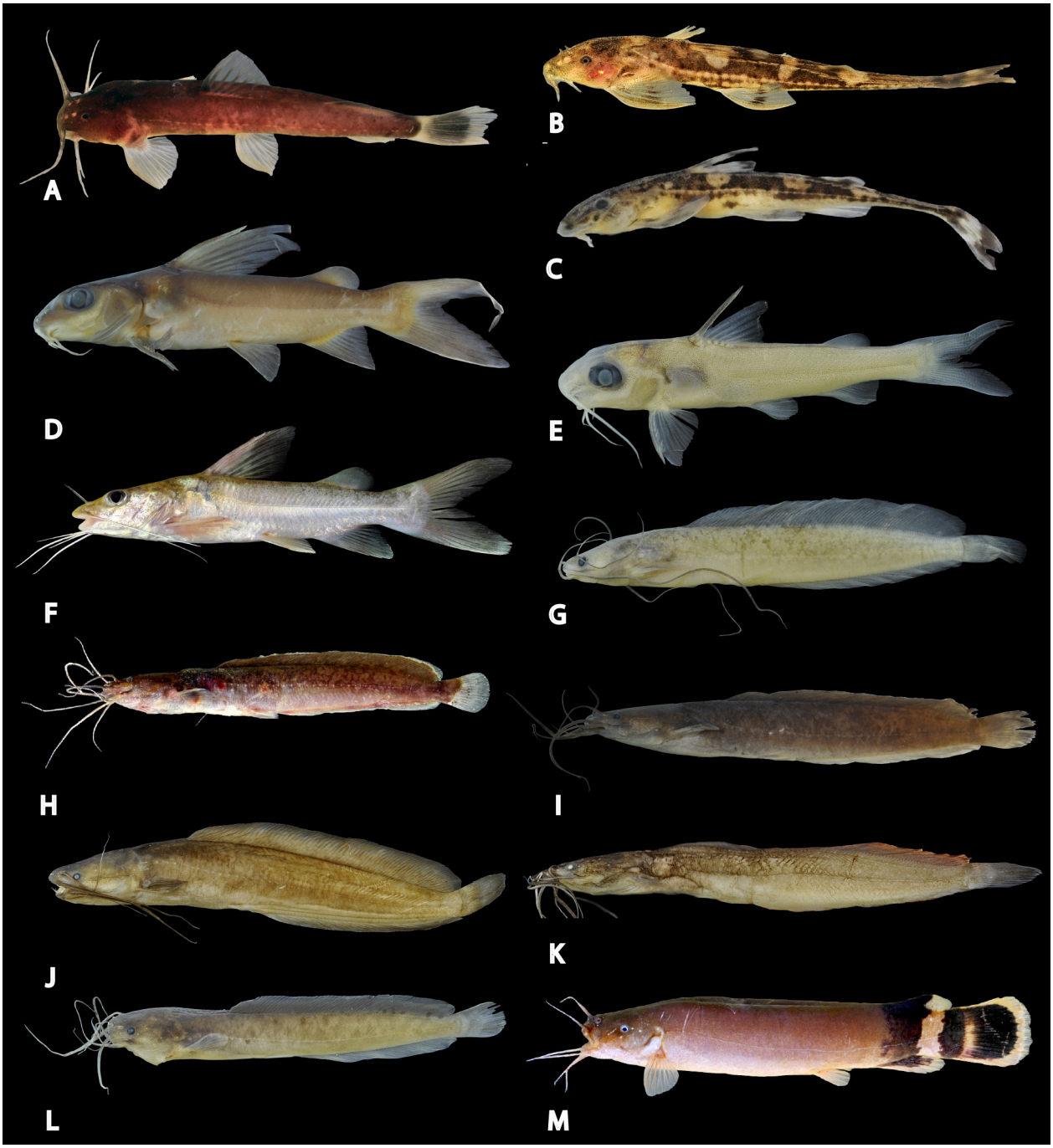

Figure 6. Siluriformes collected on this expedition. **A.** *Amphilius nigricaudatus*, SL = 49 mm, euthanized. **B.** *Phractura brevicauda*, SL = 45 mm, euthanized. **C.** *Phractura longicauda*, SL = 41 mm, preserved. **D.** *Chrysichthys nigrodigitatus*, SL = 131 mm, preserved. **E.** *Chrysichthys ogooensis*, SL = 49 mm, preserved. **F.** *Chrysichthys thysi*, SL = 135 mm, preserved. **G.** *Clarias buthupogon*, SL = 73 mm, preserved. **H.** *Clarias camerunensis*, SL = 107 mm, euthanized. **I.** *Clarias jaensis*, SL = 131 mm, preserved. **J.** *Clarias pachynema*, SL = 111 mm, preserved. **K.** *Clarias platycephalus*, SL = 52 mm, preserved. **L.** *Clarias submarginatus*, SL = 57 mm, preserved. **M.** *Malapterurus oguensis*, SL = 175 mm, euthanized.

***Phractura brevicauda* (Boulenger, 1911)**

Material examined. GABON • 3, 45.2−50.1 mm; stagnant river east of Lastoursville and south of road R19 near bridge, Ogooué drainage; −0.8077, 12.9263; 10 Sep. 2014; Colin Apse, Jean Hervé Mvé Beh, John P. Sullivan, Thibault Cavalier de Cuverville leg.; OS19647. • 1, 45.1 mm; stagnant river east of Lastoursville and south of road R19 near bridge, Ogooué drainage; −0.8077, 12.9263; 10 Sep. 2014; Colin Apse, Jean Hervé Mvé Beh, John P. Sullivan, Thibault Cavalier de Cuverville leg.; OS19645. • 1, 29.78 mm; small stream (Lewogo) in Lékoni drainage; −1.1077, 13.5510; 22 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas leg.; OS19855. • 1; stagnant river east of Lastoursville and south of road R19 near bridge, Ogooué drainage; −0.8077, 12.9263; 10 Sep. 2014; Colin Apse, Jean Hervé Mvé Beh, John P. Sullivan, Thibault Cavalier de Cuverville leg.; OS19646. Table 2, Figure 6B.

Identification. Body with visible bilateral, dorsal and ventral linear bony ridges. Caudal penduncle relatively short, 3–4.2 times in SL and slender. Length of caudal peduncle 8–16 times depth.

***Phractura longicauda* (Boulenger, 1903)**

Material examined. GABON • 5, 34.53–41.88 mm; small stream (Lewogo) in Lékoni drainage; −1.1077, 13.5510; 22 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas leg.; OS19656. Table 2, Figure 6C.

Identification. Body with visible bilateral, dorsal and ventral linear bony ridges. Caudal peduncle long (>33% of standard length) and extremely slender (length more than 18 times depth). Interorbit wide, width 1.5–2 times orbit diameter.

***Malapterurus oguensis* (Sauvage, 1879)**

Material examined. GABON • 1, 133.9 mm; small stream running behind forestry camp between camp and confluence with Lélama, Sébé drainage; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Marie-Claire Paiz leg.; OS19903. Table 2, Figure 6M.

Identification. Rayed dorsal fin absent, adipose fin present. Dorsal and flank unspotted, caudal saddle and bar pattern expressed intensely. Saddle continuous with anal fin pigmentation. Venter unmarked.

***Parauchenoglanis punctatus* (Boulenger, 1902)**

Material examined. GABON • 1, 282.17 mm; confluence of Moumba and Ogooué rivers; −0.8923, 12.9706; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19427. • 1, 152.1 mm; Lélama Creek; −0.9961, 13.5257; 19 Sep. 2014; John P. Sullivan leg.; OS19870. • 1, 108.7 mm; Lélama Creek; −0.9961, 13.5257; 19 Sep. 2014; John P. Sullivan leg.; OS19869. • 1, 84.73 mm; small stream near Hotel Escale de l'Ogooué, Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19655. • 1, 44.96 mm; small stream near Hotel Escale de l'Ogooué, Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19532. Table 2, Figure 7A.

Identification. Supraoccipital process and first nuchal plate in contact. Premaxillary tooth plate narrow (7–18% head length). Caudal peduncle short. Pectoral spine strongly serrated on anterior margin. Barbels very long, external mandibular barbel reaching beyond the tip of the pectoral spine. Typically, with 6–11 vertical rows of black dots on flanks.

***Notoglanidium macrostoma* (Pellegrin, 1909)**

Material examined. GABON • 1, 31.94 mm; small stream running behind forestry camp between camp and confluence with Lélama; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou, Marie-Claire Paiz leg.; OS19853. Table 2, Figure 7B.

Identification. Snout broad and flat. Eye covered with skin (without free border) and dorsally positioned on head. Supraoccipital process well separated from first nuchal plate. Head and body moderately depressed with a maximal body depth of 16–18% standard length. Seven dorsal fin rays and 9–13 anal fin rays.

***Atopochilus savorgnani* (Sauvage, 1879)**

Material examined. GABON • 1, 39.71 mm; Bakoussou stream at road R19 east of Lastoursville; −0.7731, 12.891; 10 Sep. 2014; Brian L. Sidlauskas, Joseph S. Cutler, Thibault Cavalier de Cuverville, Jean Hervé Mvé Beh, Colin Apse leg.; OS19648. Table 2, Figure 7C.

Identification. Lips well developed, forming a sucker disk. Mandibular barbels fused into lower lip. Eye with free border. Mandibular teeth uniformly distributed along the lower jaw in a straight row. Pectoral spine with well-developed serrations along the posterior margin.

***Chiloglanis cameronensis* (Boulenger, 1904)**

Material examined. GABON • 1, 20.42 mm; Moumba River; −0.7587, 12.9810; 12 Sep. 2014; Joseph S. Cutler, Gervais Koudaou leg.; OS19662. Table 2, Figure 7D.

Identification. Lips well developed, forming a round sucking disk. Pectoral spines serrations weakly developed. Mandibular teeth concentrated toward jaw symphysis. Mandibular barbels moderately long. Entire surface of sucker disk covered with papillae of similar size. Mandibular teeth 4+4 to 8+8.

***Synodontis tessmanni* (Pappenheim 1911)**

Material examined. GABON • 1, 100.3 mm; wooded area on left bank of Sébé River upstream from sand beach near bridge; −0.93494, 13.3570; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19910. Table 2, Figure 7E.

Identification. Lips not forming a sucker or oral disk.

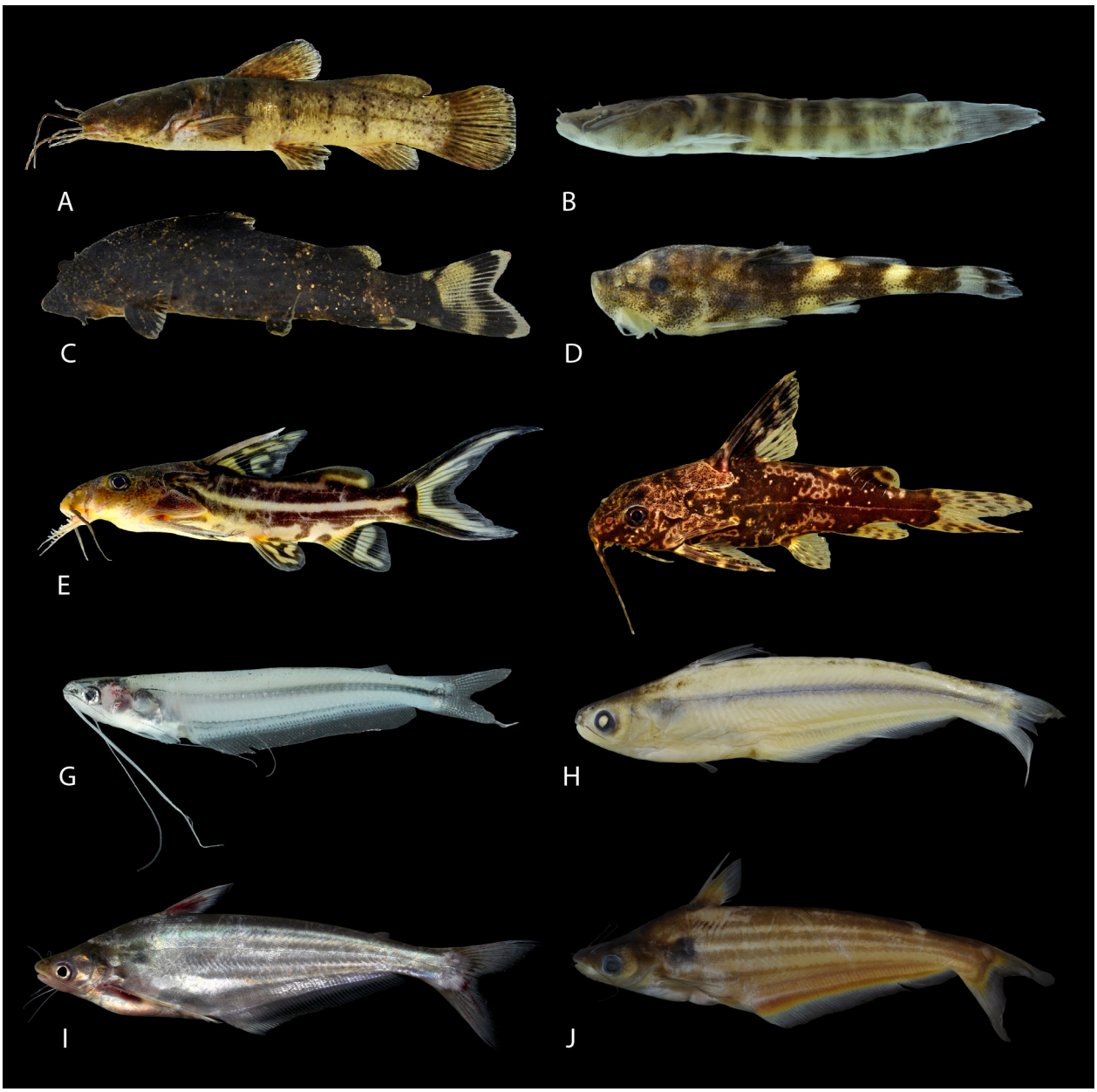

Figure 7. Siluriformes collected on this expedition. **A.** *Parauchenoglanis punctatus*, SL = 282 mm, euthanized. **B.** *Notoglanidium macrostoma*, SL = 33 mm, preserved. **C.** *Atopochilus savorgnani*, SL = 40 mm, euthanized. **D.** *Chiloglanis cameronensis*, SL = 20 mm, preserved. **E.** *Synodontis tessmanni*, SL = 101 mm, euthanized. **F.** *Synodontis batesii*, SL = 62 mm, euthanized. **G.** *Pareutropius debauwi*, SL = 94 mm, preserved. **H.** *Parailia occidentalis*, SL = 36 mm, preserved. **I.** *Schilbe grenfelli*, SL = 165 mm, euthanized. **J.** *Schilbe multitaeniatus*, SL = 147 mm, preserved.

Mandibular barbels highly branched. Eye with a free border. Caudal fin forked. Dorsal spine not serrated along entire anterior edge. Opercle without a bony spine and smooth. Maxillary barbel bordered with broad membrane, and 0.8–2.2 times head length. Fewer than 50 mandibular teeth. Interorbital distance 58.5–86.6% of snout length. Body uniformly colored, caudal fin not spotted.

Synodontis batesii (Boulenger, 1907)

Material examined. GABON • 1, 67.3 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 19 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh.; OS19874. • 1, 63.47 mm; Moumba River; −0.7587, 12.9810; 12 Sep. 2014; Joseph S. Cutler, Gervais Koudaou leg.; OS19641. • 1, 61.88 mm; Moumba River; −0.7587, 12.9810; 13 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19640. • 2, 54.71–60.8 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 19 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19639. Table 2, Figure 7F.

Identification. Lips not forming a sucker or oral disk. Mandibular barbels highly branched. Eye with a free border. Caudal fin forked. Dorsal spine fully serrated along entire anterior edge. Eye large (18–21% of head length). Body with two large clear transverse bands.

***Pareutropius debauwi* (Boulenger, 1900)**

Material examined. GABON • 1, 93.69 mm; right bank of Ogooué River at Doumé village; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19638. • 1, 82.88 mm; right bank of Ogooué River at Doumé village; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19636. • 1, 76.73 mm; wooded area on left bank of Sébé River upstream from sand beach near bridge; −0.93494, 13.3570; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19635. • 2, 44.63–45.42 mm; Moumba River; −0.7587, 12.9810; 13 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19634. • 1, 40.04 mm; Ogooué River at Hotel Escale de l'Ogooué, Lastoursville; −0.8080, 12.7448; 7 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19654. • 1, 39.76 mm; Ogooué River at Doumé, below the rapids; −0.8413, 12.9654; 17 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19731. • 1, 36.54 mm; Ogooué River at Doumé, below the rapids; −0.8413, 12.9654; 17 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19729. • 13, 23.52–70.34 mm; Sébé River at sand beach near bridge; −0.93494, 13.3570; 20 Sep. 2014; Jean Hervé Mvé Beh, Gervais Koudaou, Thibault Cavalier de Cuverville leg.; OS19637. Table 2, Figure 7G.

Identification. Rayed dorsal fin present with 3–5 branched rays. One pair of mandibular barbels. Dorsal dark band continues onto the caudal fin. No dark oblique band. no spots on the caudal lobes. 30–54 branched anal fin rays.

***Parailia occidentalis* (Pellegrin 1901)**

Material examined. GABON • 1, 36mm; Moumba River; −0.7587, 12.9810; 13 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19725. Table 2, Figure 7H.

Identification. Rayed dorsal fin absent. Adipose fin present. Inner side of pectoral spine feebly serrated. Vomerine teeth absent. A dark triangular blotch at the base of the caudal fin.

***Schilbe grenfelli* (Boulenger, 1900)**

Material examined. GABON • 1, 187.66 mm; right bank of Ogooué River at Doumé village; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19625. • 1, 178.7 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19622. • 1, 164.79 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19624. • 1, 152.4 mm; wooded area on left bank of Sébé River upstream from sand beach near bridge; −0.9349, 13.3570; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas, Gervais Koudaou leg.; OS19995. • 1, 146.83 mm; right bank of Ogooué River at Doumé village; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19623. • 1, 136.47 mm; right bank of Ogooué River at Doumé village; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19551. Table 2, Figure 7I.

Identification. Rayed dorsal present with six branched rays. Two pairs of mandibular barbels. Adipose fin present and fully developed. Anterior nostrils closer to each other than the posterior pair. Nasal barbel not reaching beyond the posterior border of the eye. Inner side of pectoral spine weakly serrated.

***Schilbe multitaeniatus* (Pellegrin, 1913)**

Material examined. GABON • 1, 148.7 mm; left bank of Sébé River, main channel near bridge; −0.9356, 13.3573; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19877.

• 1, 130.2 mm; wooded area on left bank of Sébé River upstream from sand beach near bridge; −0.9349, 13.3570; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas, Gervais Koudaou leg.; OS19889. • 1, 119.7 mm; left bank of Sébé River, main channel near bridge; −0.9356, 13.3573; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19878. Table 2, Figure 7J.

Identification. Rayed dorsal present with six branched rays. Two pairs of mandibular barbels. Adipose fin present and fully developed. Posterior nostrils as close to each other as the anterior pair. Inner side of pectoral spine weakly serrated. Coloration predominantly with several dark lateral streaks. Nasal barbel always reaching beyond posterior eye border.

***Hemichromis elongatus* (Guichenot, 1861)**

Material examined. GABON • 2, 126.0–150.83 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou leg.; OS19573. • 1, 116.7 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 19 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19867. • 1, 105.09 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, leg.; OS19574. • 1, 78.14 mm; Ogooué River at Hotel Escale de l'Ogooué, Lastoursville; −0.8080, 12.7448; 7 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19580. • 1, 49.48 mm; Moumba River; −0.7587, 12.9810; 12 Sep. 2014; Joseph S. Cutler, Gervais Koudaou leg.; OS19578. • 1, 40.35 mm; right bank of Ogooué River at factory near Doumé village; −0.8417, 12.9558; 17 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19577. • 2, 39.05–59.31 mm; small stream (Lewogo) in Lékoni drainage; −1.1077, 13.5510; 22 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas leg.; OS19579. • 2, 29.02–30.51mm; Ogooué River at Doumé village; −0.8424, 12.9624; 16 Sep. 2014; Yves Fermon leg.; OS19576. • 1, 21.95 mm; road 19 east of Compagnie Equatoriale des Bois headquarters; −0.7446, 13.0250; 12 Sep. 2014; Gervais Koudaou,

Jean Hervé Mvé Beh, Thibault Cavalier de Cuverville leg.; OS19575. • 1, 18.72 mm; Moumba River; −0.7587, 12.9810; 12 Sep. 2014; Joseph S. Cutler, Gervais Koudaou leg.; OS19582. • 5, 17.45–18.32 mm; Moumba River; −0.7587, 12.9810; 12 Sep. 2014; Joseph S. Cutler, Gervais Koudaou leg.; OS19581. Table 2, Figure 8E.

Identification. Teeth unicuspid, no visor-like hanging pharyngeal pad. 4–5 distinct vertical bars on flanks, a series of red dots (often forming horizontal rows along the flanks). Two rows of teeth on upper jaw.

Hemichromis stellifer (Loiselle, 1979)

Material examined. GABON • 1, 34.32 mm; small stream near Hotel Escale de l'Ogooué - Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19590. • 1, 31.48 mm; small stream near Hotel Escale de l'Ogooué - Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19588. • 1, 23.7 mm; small stream near Hotel Escale de l'Ogooué - Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19589. Table 2, Figure 8F.

Identification. Teeth unicuspid, no visor-like hanging pharyngeal pad. One relatively large mid-lateral black spot present. Iridophores rarely present on body or unpaired fins. Single row of small teeth in upper jaw.

Bryconalestes intermedius (Boulenger 1903)

Material examined. GABON • 4, 20.82–69.20 mm; small stream (Lewogo) in Lékoni drainage; −1.1077,

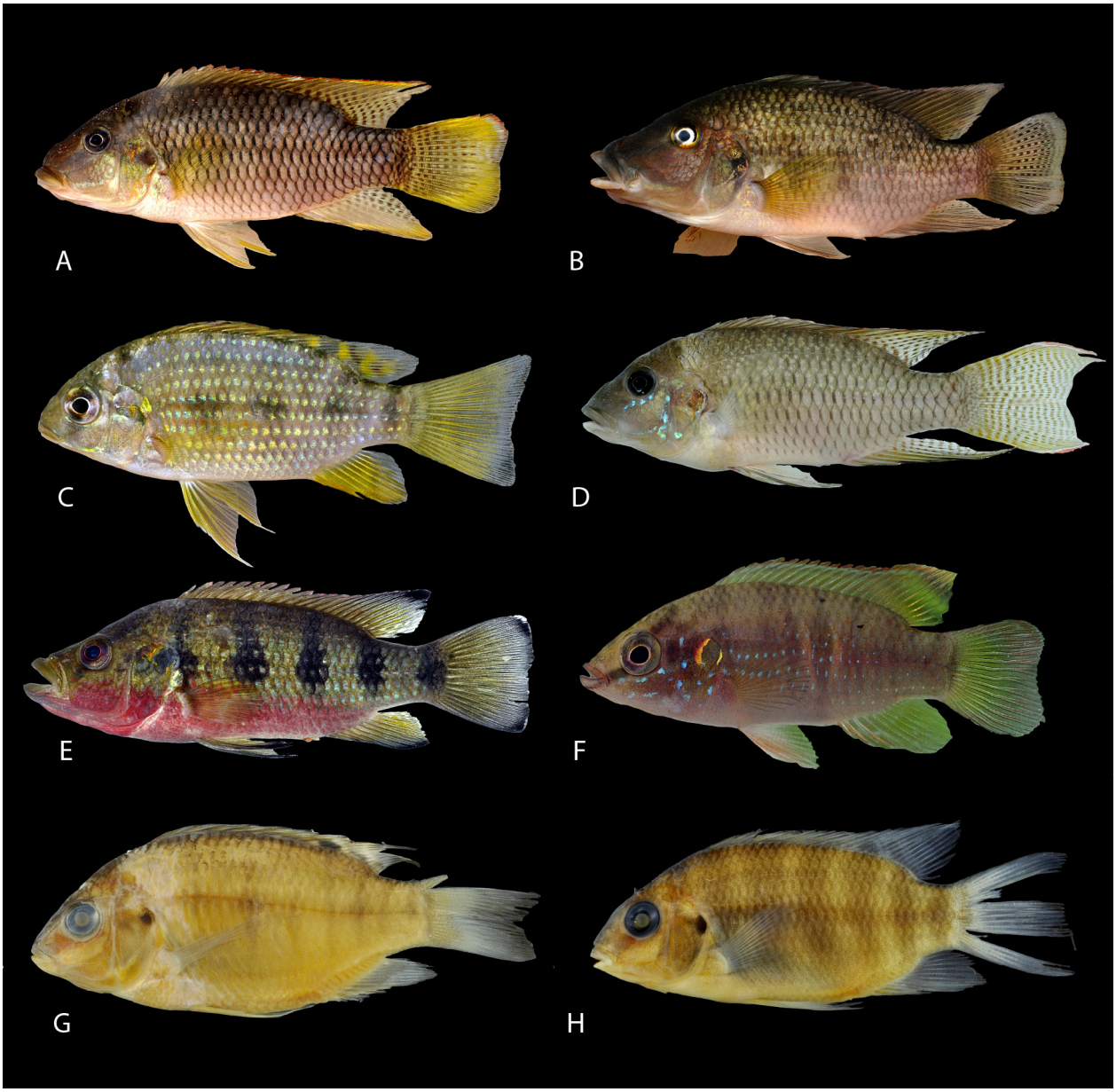

Figure 8. Perciformes collected on this expedition. **A.** *Chromidotilapia kingsleyae*, SL = 91 mm, euthanized. **B.** *Chromidotilapia regani*, SL = 152 mm, euthanized. **C.** *Coptodon tholloni*, SL = 47 mm, euthanized. **D.** *Divandu albimarginatus*, SL = 112 mm, euthanized. **E.** *Hemichromis elongatus*, SL = 105 mm, euthanized. **F.** *Hemichromis stellifer*, SL = 31 mm, euthanized. **G.** *Oreochromis schwebischi*, SL= 70 mm, preserved. **H.** *Pelmatolapia cabrae*, SL = 51 mm, preserved.

13.5510; 22 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas leg.; OS19688. Table 2, Figure 9E.

Identification. Species of the genus *Bryconalestes* are externally differentiable from other members of Alestidae by the possession of a combination of an open frontoparietal fontanelle, three teeth in the outer premaxillary tooth row, and a robust and almost molariform morphology of the symphyseal teeth in the second premaxillary row. Zanata and Vari (2005) listed four additional synapomorphies for the clade, including a ventrally directed process of the supraorbital, sexual dimorphism of the anterior dorsal-fin rays and pelvic-fin rays, and extension of a portion of the anterior and middle anal-fin rays. Within the genus, *B. intermedius* can be separated from all other valid species except *Bryconalestes tholloni* by the presence of an additional transverse scale row above the lateral line (6.5 versus 5.5). *Bryconalestes interme-*

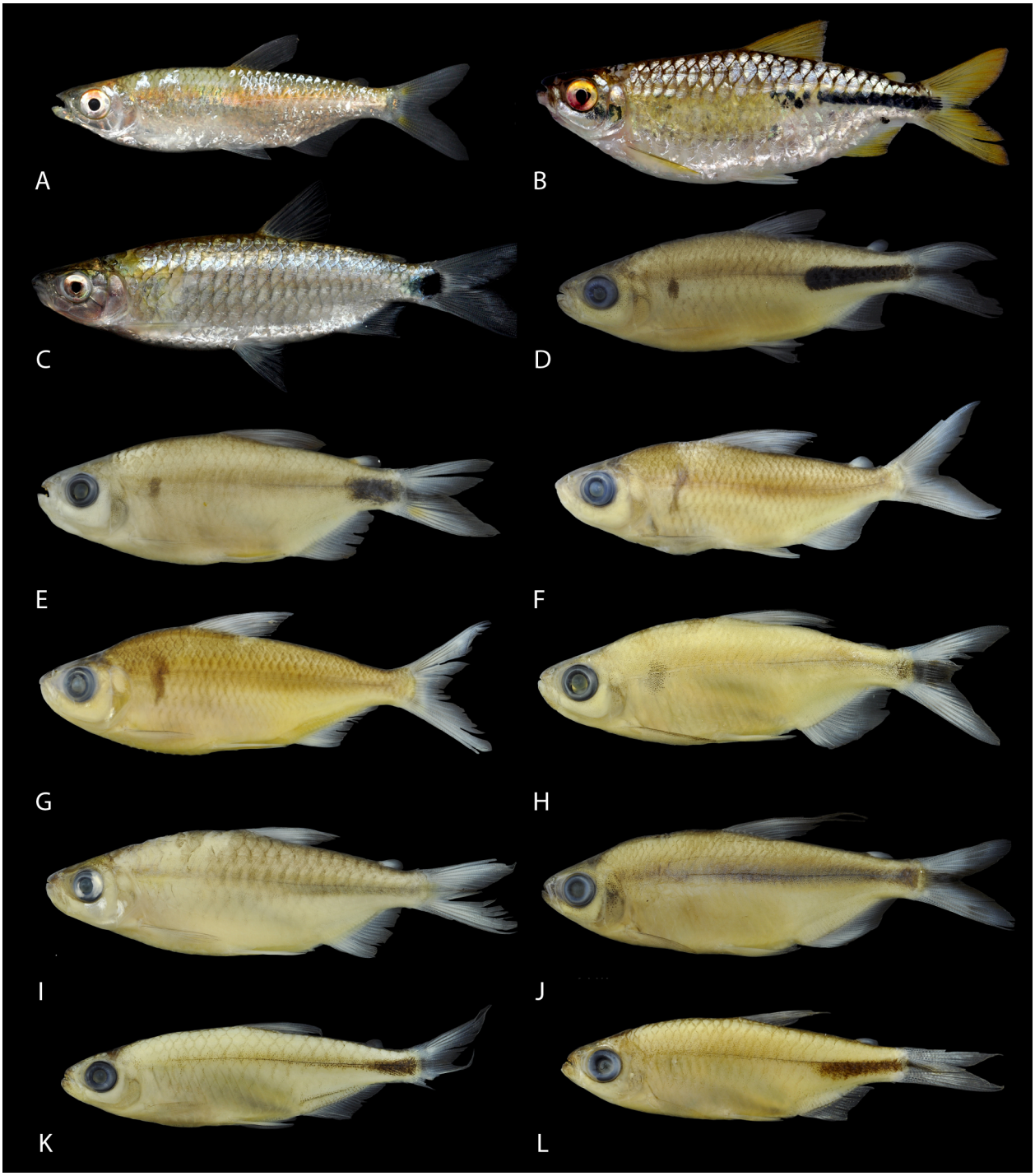

Figure 9. Alestids collected on this expedition. **A.** *Bryconalestes longipinnis*, SL = 61 mm, euthanized. **B.** *Brycinus opisthotaenia*, SL = 81 mm, euthanized. **C.** *Brycinus macrolepidotus*, SL = 125 mm, euthanized. **D.** *Brycinus kingsleyae*, SL = 49 mm, preserved. **E.** *Brycinus intermedius*, SL = 69 mm, preserved. **F.** *Bryconaethiops macrops*, SL = 102 mm, preserved. **G.** *Bryconaethiops microstoma*, SL = 112 mm, preserved. **H.** *Nannopetersius ansorgii*, SL = 51 mm, preserved. **I.** *Brycinus taeniurus*, SL 81 mm, preserved. **J.** *Nannopetersius lamberti*, SL = 71 mm, preserved. **K.** *Phenacogrammus aurantiacus*, SL = 42 mm, preserved. **L.** *Phenacogra mmus urotaenia*, SL 42 mm, preserved.

dius is most similar to *Bryconalestes tholloni* (not captured on this trip) but can be separated by its fewer anal fin rays (19–21 versus 22–25) and lateral line scales (31–34 versus 34–38).

***Distichodus notospilus* (Günther 1867)**

Material examined. GABON • 1, 104.28 mm; right bank of Ogooué River at Doumé village; −0.8424, 12.9624; 17 Sep. 2014; Joseph S. Cutler leg.; OS19544. • 2, 93.25–117.11 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19529. • 1, 85.65 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19543. • 1, 74.98 mm; Lélama Creek; −0.9961, 13.5257; 19 Sep. 2014; John P. Sullivan leg.; OS19527. • 1, 27.44 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside in Sébé drainage; −0.9938, 13.5262; 19 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19514. Table 2, Figure 10A.

Identification. Relatively deep bodied, subterminal mouth with two rows of bicuspid teeth in each jaw. 38–43 scales in lateral line. Flanks without distinct markings other than vertically elongate spots on the flanks and a vertically elongate spot present at the base of the caudal fin.

***Distichodus hypostomatus* (Pellegrin 1900)**

Material examined. GABON • 1, 181.5 mm; left bank of Sébé River, main channel near bridge; −0.9356, 13.3573; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19876.

• 1, 111.68 mm; left bank of Ogooué River at Doumé above the rapids; −0.8414, 12.9658; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19541. • 1, 97.1 mm; Bakoussou stream at road R19 east of Lastoursville; −0.7731, 12.8915; 10 Sep. 2014; Brian L. Sidlauskas, Colin Apse, Thibault Cavalier de Cuverville, Jean Hervé Mvé Beh leg.; OS19542. • 1, 73.0 mm; Bakoussou stream at road R19 east of Lastoursville; −0.7731, 12.8915; 10 Sep. 2014; Brian L. Sidlauskas, Colin Apse, Thibault Cavalier de Cuverville, Jean Hervé Mvé Beh leg.; OS19518. • 1, 69.95 mm; left bank of Ogooué River at Doumé above the rapids; −0.8414, 12.9658; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19540. • 2, 59.34-67.39 mm; left bank of Ogooué River at Doumé above the rapids; −0.8414, 12.9658; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19523. • 1, 35.52 mm; road 19 east of Compagnie Equatoriale des Bois headquarters at stream crossing; −0.7442, 12.9994; 13 Sep. 2014; Thibault Cavalier de Cuverville, Gervais Koudaou leg.; OS19526. Table 2, Figure 10B.

Identification. Body elongate, mouth distinctly inferior with two rows of bicuspid teeth in each jaw. 53–60 scales in lateral line. Flanks with a series of distinct vertically elongate bars, caudal peduncle without dark spot.

***Aphyosemion lamberti* (Radda & Huber, 1977)**

Material examined. GABON • 1, 31.06 mm; Moumba River; −0.7587, 12.9810; 13 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19733. • 1, 27.55 mm; spring behind school at Doumé village; −0.8443, 12.9638; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19736. • 1, 22.08 mm; spring behind school at Doumé village; −0.8443, 12.9638; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19734. • 1, 21.26 mm; wooded area on left bank of Sébé River upstream from sand beach near bridge; −0.9349, 13.3570; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19735. Table 2, Figure 11A.

Identification. Preopercular canal tubular with six pores. Dorsal fin inserted well behind fourth anal fin ray. No longitudinal dark band, red ventral bank, or red bands on flanks. No vertical bars or concentric pigmentation pattern in caudal fin. Caudal fin with interradial stripes (flamed), and acuminate, dorsally and ventrally edged with dark red. Ground color of unpaired fins red.

***Aphyosemion cyanostictum* (Lambert & Géry, 1968)**

Material examined. GABON • 1, 25.76 mm; small stream 2 km east of Lélama; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Brian L. Sidlauskas, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19854. • 1, 23.2 mm; small stream 2 km east of Lélama; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Brian L. Sidlauskas, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19823. • 1, 21.22 mm; small stream 2 km east of Lélama; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Brian L. Sidlauskas, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19803. • 1, 20.04 mm; small stream 2 km east of Lélama; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Brian L. Sidlauskas, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19852. Table 2, Figure 11B.

Identification. We tentatively identified one specimen as *Aphyosemion cyanostictum*. That species is distinguished from most other *Aphyosemion* species by morphology and breeding coloration. *Aphyosemion cyanostictum* is a small-bodied species, with the origin of the dorsal fin opposite or slightly in front of the anal fin origin (Lambert and Géry 1968). *Aphyosemion cyanostictum* have a dorsal fin with 10–12 rays, and 10–12 anal fin rays. The caudal peduncle has fewer than 13 circumpeduncular scales and there are 26–27 scales in the longitudinal series. The dorsal and caudal fins in *A. cyanostictum* are not elongate, and the dorsal fin tips do not reach the base of the caudal fin. As with most killifish, male breeding coloration is critical in assigning specimens to species. Breeding males of *A. cyanostictum* are typically scarlet red, becoming red brown dorsally. The flank scales typically show a white or light blue spot. The median fins are red with light blue spots and a thin blue margin. The anal fin has no orange marking. Females are uniformly grey-brown, becoming lighter ventrally. *A. cyanostictum* never shows two black bands on

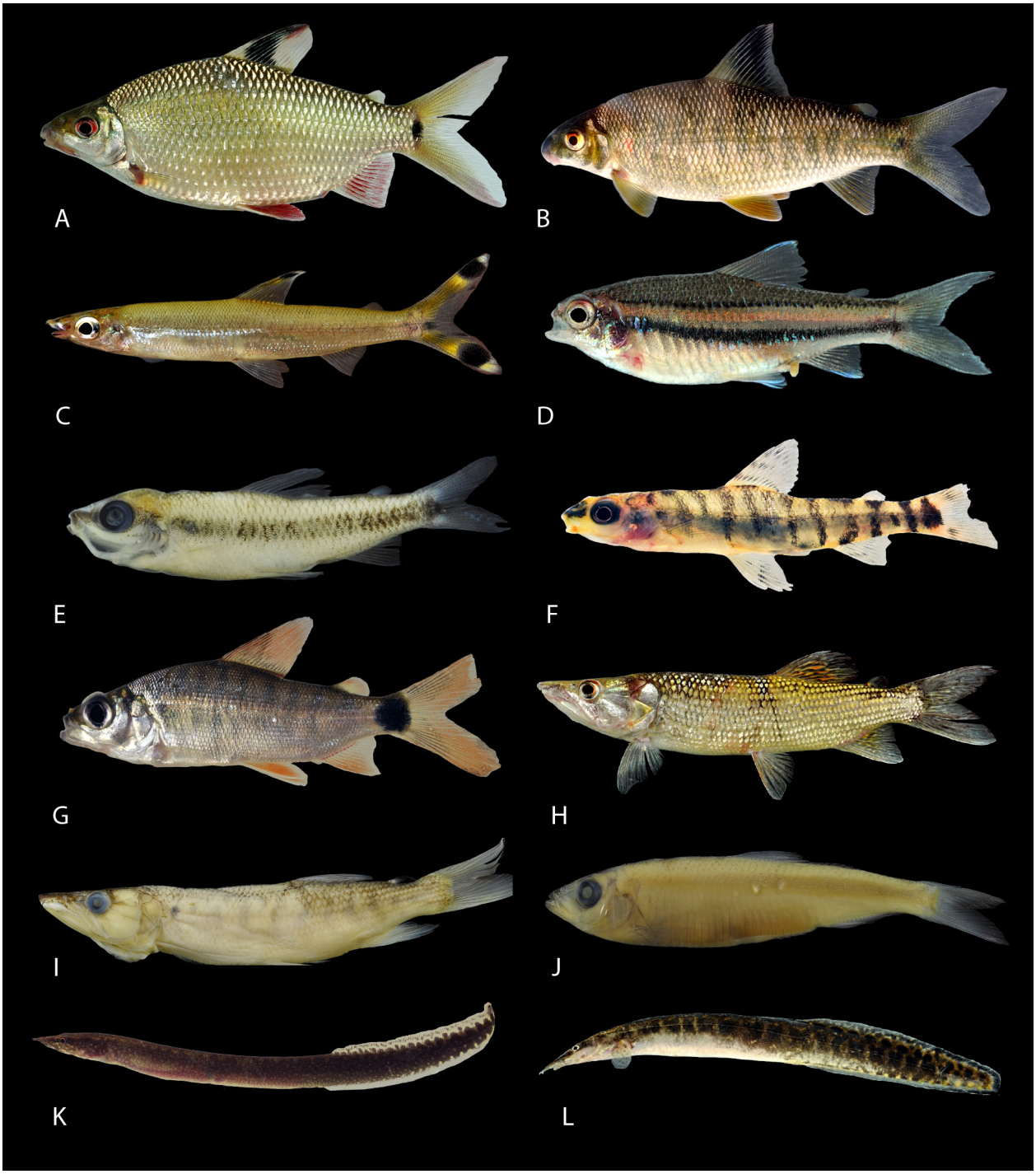

Figure 10. Characiformes, Clupeiformes and Synbranchiformes collected on this expedition. **A.** *Distichodus notospilus*, SL = 104 mm, euthanized. **B.** *Distichodus hypostomatus*, SL = 97 mm, euthanized. **C.** *Monistichodus elongatus*, SL = 59 mm, euthanized. **D.** *Neolebias trewavasae*, SL = 31 mm, euthanized. **E.** *Nannocharax parvus*, SL = 26 mm, preserved. **F.** *Nannocharax intermedius*, SL = 28 mm, euthanized. **G.** *Xenocharax spilurus*, SL = 77 mm, euthanized. **H.** *Hepsetus lineatus*, SL = 219 mm, euthanized. **I.** *Hepsetus kingsleyae*, SL = 154 mm, preserved. **J.** *Pellonula vorax*, SL = 91 mm, preserved. **K.** *Mastacmbelus niger*, SL = 86 mm, euthanized. **L.** *Mastacembelus marchei*, SL = 161 mm, euthanized.

the flanks even when stressed (as do species in the genus *Chromaphyosemion*). The specimen collected on this expedition (which was a male in breeding coloration) is distinguished from all other known populations of *A. cyanostictum* in two fashions; the specimen has a distinct blue band of scales running down the midline of the fish, and the pigmentation pattern on the dorsal and anal fin is neatly banded, whereas in other populations the fins are spotted (Fig. 11B). It is noteworthy that within *Aphyosemion*, small differences in color pattern often reflect significant genetic differences (Van der Zee pers. comm.). *Aphyosemion cyanostictum* is otherwise only known from the Ivindo drainage; thus, our collection near Lastoursville represents a major extension to the range of this species or might represent a new species entirely.

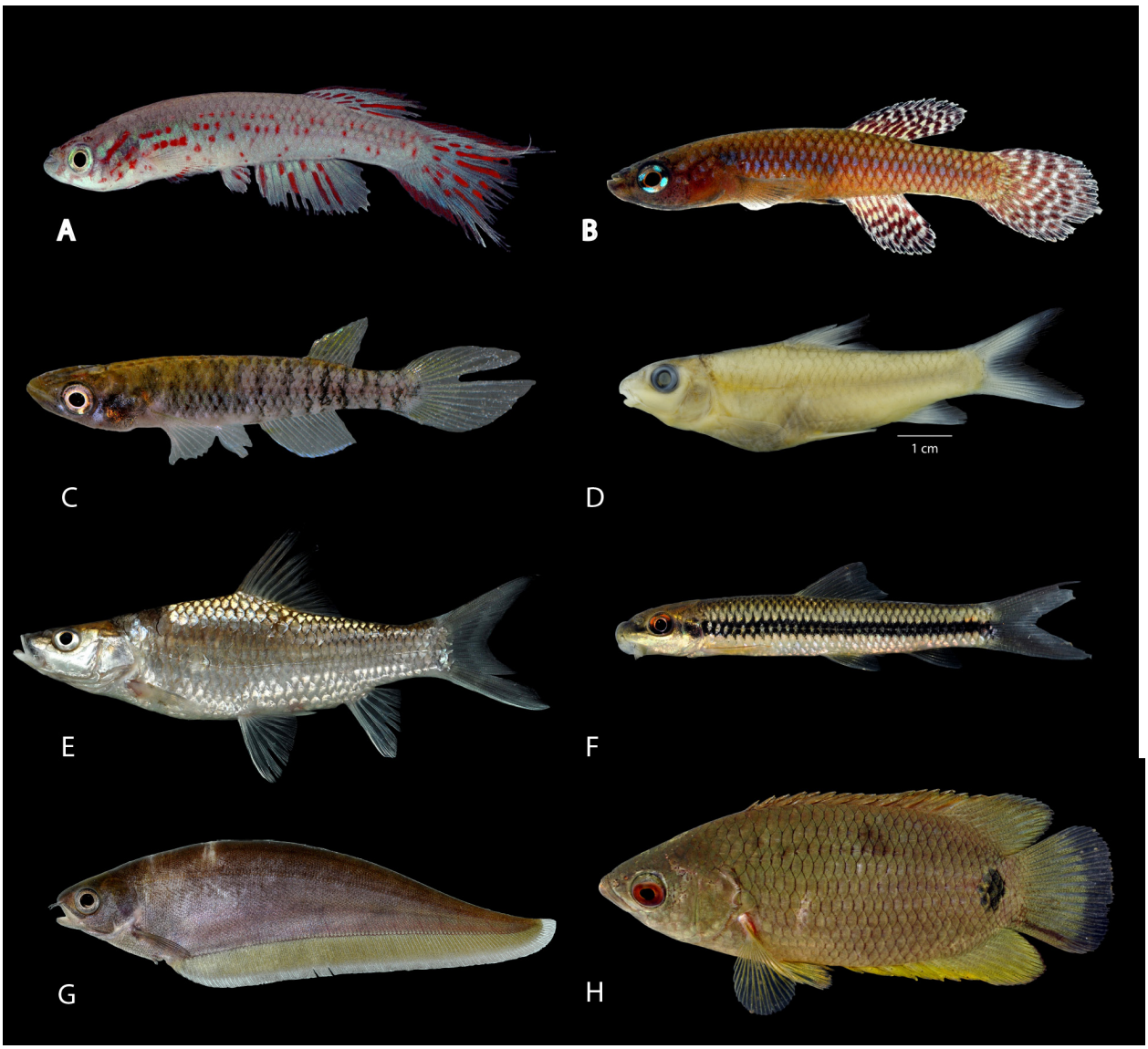

Figure 11. Cyprinodontiformes, Cypriniformes, Osteoglossiformes and Anabantiformes collected on this expedition. **A.** *Aphyosemion lamberti*, SL = 31.06 mm, live. **B.** *Aphyosemion* cf. *cyanostictum*, SL = 23.2 mm, live. **C.** *Epiplatys neumanni*, SL = 21.2 mm, live. **D.** *Labeobarbus malacanthus*, SL = 68.72 mm, preserved. **E.** *Labeobarbus progenys*, SL = 125.8 mm, euthanized. **F.** *Labeo annectens*, SL = 17.95 mm, euthanized. **G.** *Xenomystus nigri*, SL = 142.4 mm, euthanized. **H.** *Ctenopoma kingsleyae*, SL = 78.2 mm, euthanized.

***Epiplatys neumanni* (Berkenkamp, 1993)**

Material examined. GABON • 1, 21.2 mm; small stream 2 km east of Lélama; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas, Gervais Koudaou leg.; OS19822. Table 2, Figure 11C.

Identification. Preopercular canal tubular with five pores. Anterior part of lower jaw broad. Two central neuromasts in frontal laterosensory system in one pit (closed). Mouth large. Ventral head dark, without contrasting white pattern. Thin black bars on flanks.

***Labeobarbus malacanthus* (Pappenheim, 1911)**

Material examined. GABON • 1, 68.72 mm; left bank of Ogooué River at Doumé above the rapids; −0.8414, 12.9658; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19550. Table 2, Figure 11D.

Identification. 9–12 branched dorsal rays, scales with numerous convergent striae. Mouth inferior. Two pairs of barbels, posterior barbel not reaching to posterior margin of eye. Last simple ray of dorsal fin as long, or longer, than head. 27–30 scales in lateral line.

***Labeobarbus progenys* (Boulenger, 1903)**

Material examined. GABON • 1, 125.8 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 29 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Gervais Koudaou leg.; OS19888. Table 2, Figure 11E.

Identification. 9–12 branched dorsal rays, scales with numerous convergent striae. Mouth terminal. 4.5–5.5 scales between lateral line and mid-ventral line, three scales between lateral line and origin of pelvic fin. Last simple ray in dorsal fin 67% of head length.

***Xenomystus nigri* (Günther, 1868)**

Material examined. GABON • 1, 142.4 mm; right bank of Sébé River, main channel near bridge; −0.9353, 13.3576; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19890. Table 2, Figure 11G.

Identification. Pelvic and dorsal fins absent, anal fin long and confluent with caudal fin. Three branchiostegal rays, gill rakers rudimentary. Body coloration uniform brown.

***Enteromius martorelli* (Roman, 1971)**

Material examined. GABON • 1, 57.05 mm; left bank of Ogooué River at Doumé above the rapids; −0.8414, 12.9658; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19428.

GABON • 1, 53.73 mm; stagnant river east of Lastoursville and south of road R19 near bridge; −0.8077, 12.9263; 10 Sep. 2014; John P. Sullivan, Thibault Cavalier de Cuverville, Jean Hervé Mvé Beh, Colin Apse leg.; OS19429. Table 2, Figure 12A.

Identification. Two pairs barbels. 11–12 circumpeduncular scales, 20–31 scales in lateral line. Black stripe on flanks. Last simple ray of dorsal fin ossified and serrated. Black spot at base of first rays of dorsal fin.

***Enteromius trispilomimus* (Boulenger, 1907)**

Material examined. GABON • 1, 28.06 mm; Sébé River at sand beach near bridge; −0.9349, 13.357; 20 Sep. 2014; Thibault Cavalier de Cuverville, Jean Hervé Mvé Beh, Gervais Koudaou leg.; OS19426. Table 2, Figure 12B.

Identification. Barbels absent or very small. 8–10 circumpeduncular scales. Lateral line complete with 21–23 scales in lateral line. Three oval or round spots on the sides.

***Enteromius camptacanthus* (Bleeker, 1863)**

Material examined. GABON • 1, 86.55 mm; small stream near Hotel Escale de l'Ogooué, Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19430. • 1, 70.01 mm; small stream near Hotel Escale de l'Ogooué, Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19432. • 1, 56.5 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Brian L. Sidlauskas, Jean Hervé Mvé Beh, Gervais Koudaou leg.; OS19892. • two, 55.63–58.65 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Brian L. Sidlauskas, Jean Hervé Mvé Beh, Gervais Koudaou leg.; OS19431. • 1, 42.2 mm; small stream 2 km east of Lélama, Sébé drainage; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Brian L. Sidlauskas, Jean Hervé Mvé Beh, Gervais Koudaou leg.; OS19894. • 1, 28.37 mm; road 19 east of Compagnie Equatoriale des Bois headquarters; −0.7446, 13.0250; 12 Sep. 2014; Jean Hervé Mvé Beh, Gervais Koudaou, Thibault Cavalier de Cuverville leg.; OS19433. Table 2, Figure 12C.

Identification. Two pairs barbels. 11–12 circumpeduncular scales, 21–25 scales in lateral line. Two large black spots on the sides. Dorsal fin 0.8–0.9 times in head length.

***Enteromius holotaenia* (Boulenger 1904)**

Material examined. GABON • 1, 117.71 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 16 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19434. • 1, 54.13 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 17 Sep. 2014; Joseph S. Cutler leg.; OS19436. • 1, 38.56 mm; Ogooué River at Doumé village; −0.8424, 12.9624; 16 Sep. 2014; Yves Fermon leg.; OS19437. • 1, 35.73 mm; left bank of Ogooué River at Doumé above the rapids; −0.8414, 12.9658; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19435. • 1, 27.05 mm; Ogooué River at Doumé, below the rapids; −0.8413, 12.9654; 17 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19732. • 1, 26.29 mm; Ogooué River at Doumé, below the rapids; −0.8413, 12.9654; 17 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19726. Table 2, Figure 12D.

Identification. Two pairs barbels. 11–12 circumpeduncular scales, 20–31 scales in lateral line. Last simple ray of dorsal fin ossified and serrated. Large dark stripe on flanks. Dorsal fin with black markings, but no dark spot at base of first dorsal fin rays. Pectoral fins not reaching origin of pelvic fins.

***Enteromius guirali* (Thominot, 1886)**

Material examined. GABON • 1, 106.63 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 20 Sep. 2014; Joseph S. Cutler, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19563. • 1, 106.5 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 20 Sep. 2014; Joseph S. Cutler, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19866. • 1, 97.5 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 20 Sep. 2014; Joseph S. Cutler, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19865. • 3, 90.29–109.06 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 19 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19553. • 3, 82.12–113.77 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 20 Sep. 2014; Joseph S. Cutler, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19549. • 1, 71.3 mm; Lélama Creek; −0.9961, 13.5257; 19 Sep. 2014; John P. Sullivan leg.; OS19873. • 3, 67.27–83.80 mm; left bank of Sébé River, main channel near bridge; −0.9356, 13.3573; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19556. • 1, 66.4 mm; Lélama Creek; −0.9961, 13.5257; 19 Sep. 2014; John P. Sullivan leg.; OS19872. • 1, 64.32 mm; small stream near Hotel Escale de l'Ogooué, Lastoursville; −0.8055, 12.7444;

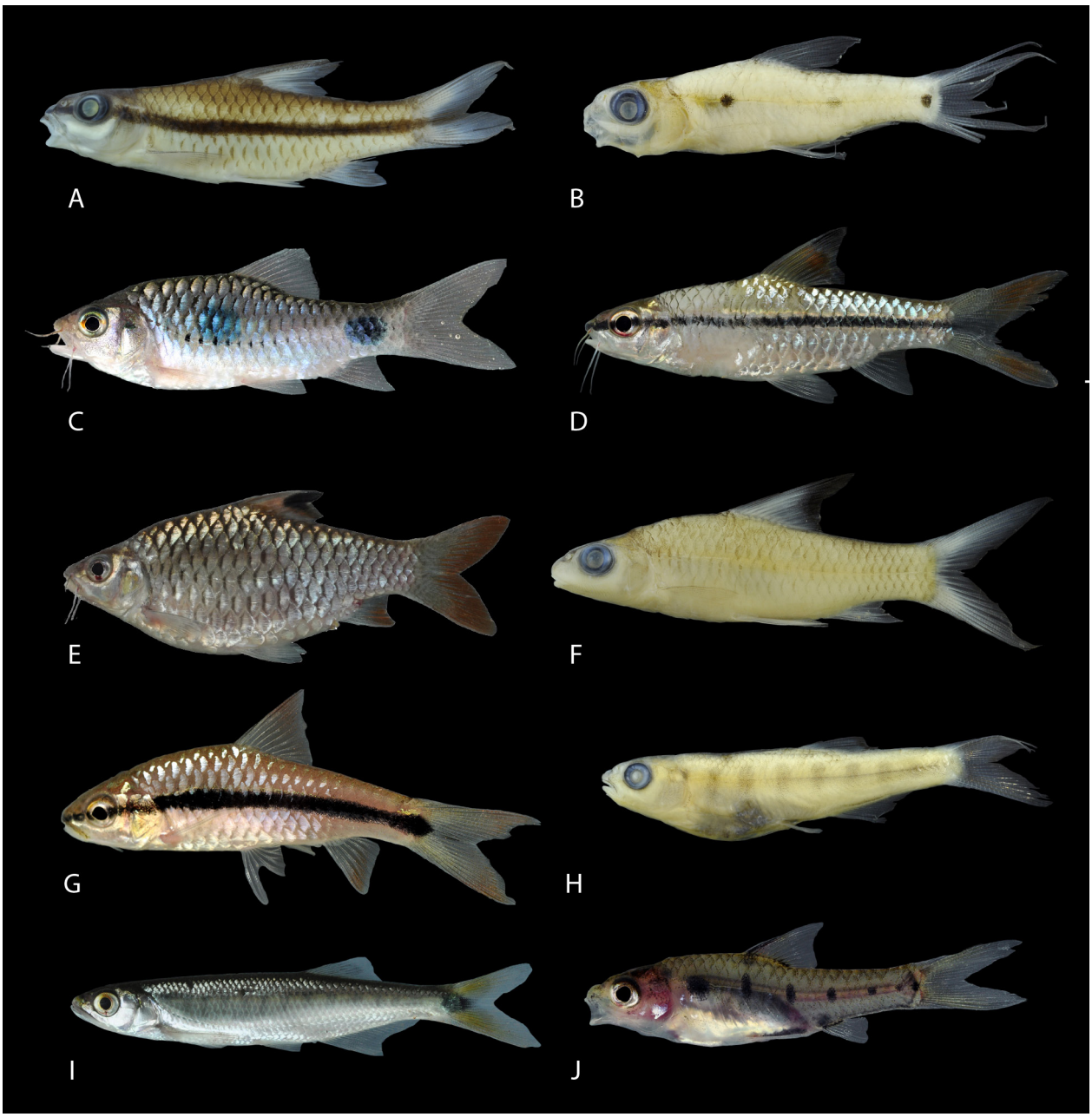

Figure 12. Cypriniformes collected on this expedition. **A.** *Enteromius martorelli*, SL = 54 mm, preserved, **B.** *Enteromius trispilomimus*, SL = 23 mm, preserved, **C.** *Enteromius camptacanthus*, SL = 56 mm, euthanized, **D.** *Enteromius holotaenia*, SL = 54 mm, euthanized, **E.** *Enteromius guirali*, SL= 61 mm, euthanized, **F.** *Enteromius brazzai*, SL = 62 mm, preserved, **G.** *Enteromius prionacanthus*, SL= 37 mm, euthanized, **H.** *Opsaridium ubangiense*, SL = 23 mm, euthanized, **I.** *Raiamas buchholzi*, SL = 74 mm, euthanized, **J.** *Enteromius jae*, SL. 22 mm, preserved.

8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19583. • 3, 64.17–88.40 mm; Rock outcrop on left bank of Sébé River just downstream from bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; OS19564. • 1, 63.76 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19620. • 2, 52.32–61.95 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19555. • 1, 52.09 mm; wooded area on left bank of Sébé River upstream from sand beach near bridge; −0.9349, 13.3570; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19570. • 1, 45.30 mm; road R19 between Lastoursville and Compagnie Equatoriale des Bois headquarters; −0.7725, 12.9117; 11 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville, Gervais Koudaou leg.; OS19571. • 1, 35.8 mm; small stream 2 km east of Lélama; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas, Gervais Koudaou leg.; OS19896. • 1, 31.62 mm; road 19 east of Compagnie Equatoriale des Bois headquarters at stream crossing; −0.7442, 12.9994; 13 Sep. 2014; Gervais Koudaou, Thibault Cavalier de Cuverville leg.; OS19561. • 1, 29.43 mm; road 19 east of Compagnie Equatoriale des Bois headquarters at stream crossing; −0.7442, 12.9994; 13 Sep. 2014; Gervais Koudaou, Thibault Cavalier de

Cuverville leg.; OS19560. • 14, 27.51–40.27 mm; sand bank on left bank of Ogooué River at Doumé village; −0.8418, 12.9636; 15 Sep. 2014; Joseph S. Cutler, Brian L. Sidlauskas, Jean Hervé Mvé Beh leg.; OS19565. • 1, 26.29 mm; Ogooué River at Doumé, below the rapids; −0.8413, 12.9654; 17 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19730. • 51, 26.21–97.11 mm; small stream (Lewogo) in Lékoni drainage; −1.1077, 13.5510; 22 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas leg.; OS19554. • 1, 25.68 mm; road 19 east of Compagnie Equatoriale des Bois headquarters; −0.7446, 13.0250; 12 Sep. 2014; Jean Hervé Mvé Beh, Gervais Koudaou, Thibault Cavalier de Cuverville leg.; OS19558. • 20, 24.10–32.81 mm; Sébé River at sand beach near bridge; −0.9349, 13.3570; 20 Sep. 2014; John P. Sullivan, Brian L. Sidlauskas, Gervais Koudaou leg.; OS19568. • 2, 23.79–24.63 mm; Ogooué River at Doumé village; −0.8424, 12.9624; 16 Sep. 2014; Yves Fermon leg.; OS19566. • 1, 23.4 mm; Ogooué River at Doumé, below the rapids; −0.8413, 12.9654; 17 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19728. • 7, 23.31–60.88 mm; Ogooué River at Doumé village; −0.8424, 12.9624; 16 Sep. 2014; Yves Fermon leg.; OS19567. • 15, 21.75–27.70 mm; Moumba River; −0.7587, 12.9810; 12 Sep. 2014; Joseph S. Cutler, Gervais Koudaou leg.; OS19569. • 1, 20.96 mm; small stream 2 km east of Lélama; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Brian L. Sidlauskas, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19802. • 36, 20.86–32.33 mm; Sébé River at sand beach near bridge; −0.9349, 13.3570; 20 Sep. 2014; Thibault Cavalier de Cuverville, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19552. • 7, 20.35–60.41 mm; small stream near Hotel Escale de l'Ogooué, Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19562. • 3, 18.36–24.13 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 19 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19557. Table 2, Figure 12E.

Identification. Two pairs barbels. 11–12 circumpeduncular scales, 20–31 scales in lateral line. No trace of any striping or spotting on sides. Last simple ray of dorsal fin heavily ossified and serrated.

Enteromius brazzai (Pellegrin, 1901)

Material examined. GABON • 1, 88.1 mm; left bank of Ogooué River at Doumé above the rapids; −0.8414, 12.9658; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19538. • 2, 62.2–64.26 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 16 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19537. • 2, 44.01–45.24 mm; small stream near Hotel Escale de l'Ogooué - Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19534. • 13, 36.53–71.43 mm; sand bank on left bank of Ogooué River at Doumé village; −0.8418, 12.9636; 13 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas leg.; OS19536. • 33, 34.47–63.55 mm; Ogooué River at Doumé village; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas leg.; OS19539. • 36, 29.16–74.12 mm; Ogooué River at Doumé village; −0.8424, 12.9624; 16 Sep. 2014; Yves Fermon leg.; OS19533. • 35, 26.0-56.2 mm; Sébé River at sand beach near bridge; −0.9349, 13.3570; 20 Sep. 2014; Jean Hervé Mvé Beh, Gervais Koudaou, Thibault Cavalier de Cuverville leg.; OS19535. • 1, 21.11 mm; small stream 2 km east of Lélama; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas, Gervais Koudaou leg.; OS19798. • 1, 18.74 mm; small stream 2 km east of Lélama; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas, Gervais Koudaou leg.; OS19800. Table 2, Figure 12F.

Identification. Barbels absent or very small. Mouth inferior or subinteroir. 12 circumpeduncular scales. Lateral line complete. No spots on the sides; 24–28 scales in lateral line. Tip of dorsal fin black.

Enteromius prionacanthus (Mahnert & Géry, 1982)

Material examined. GABON • 1, 125.18 mm; Lélama Creek at the Compagnie Equatoriale des Bois roadside; −0.9938, 13.5262; 20 Sep. 2014; Joseph S. Cutler, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19438. • 1, 78.86 mm; wooded area on left bank of Sébé River upstream from sand beach near bridge; −0.9349, 13.3570; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19390. • 1, 64.27 mm; road R19 between Lastoursville and Compagnie Equatoriale des Bois headquarters; −0.7725, 12.9117; 11 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville, Gervais Koudaou leg.; OS19444. • 2, 60.45-79.36 mm; small stream near Hotel Escale de l'Ogooué, Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19442. • 1, 36.8 mm; stagnant river east of Lastoursville and south of road R19 near bridge; −0.8077, 12.9263; 10 Sep. 2014; John P. Sullivan, Thibault Cavalier de Cuverville, Jean Hervé Mvé Beh, Colin Apse, Gervais Koudaou leg.; OS19441. • 1, 28.77 mm; right bank of Ogooué River at factory near Doumé village; −0.8417, 12.9558; 17 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19443. • 3, 26.41–36.46 mm; road R19 between Lastoursville and Compagnie Equatoriale des Bois headquarters; −0.7725, 12.9117; 11 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville, Gervais Koudaou leg.; OS19440. • 13, 26.12–50.61 mm; Sébé River at sand beach near bridge; −0.9349, 13.3570; 20 Sep. 2014; Thibault Cavalier de Cuverville, Gervais Koudaou, Jean Hervé Mvé Beh leg.; OS19439. • 1, 21.04 mm; small stream 2 km east of Lélama; −1.0085, 13.5098; 21 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh, Brian L. Sidlauskas, Gervais Koudaou leg.; OS19799. Table 2, Figure 12G.

Identification. Two pairs barbels. 11–12 circumpedun-

cular scales, 20–31 scales in lateral line. Last simple ray of dorsal fin heavily ossified and serrated. Large dark stripe on flank. Dorsal fin colorless; 25–29 scales in lateral line.

***Opsaridium ubangiense* (Pellegrin, 1901)**

Material examined. GABON • 3, 37.39-53.82mm; road R19 east of Compagnie Equatoriale des Bois headquarters at stream crossing; −0.7442, 12.9994; 13 Sep. 2014; Thibault Cavalier de Cuverville, Gervais Koudaou leg.; OS19448. • 1, 23.12 mm; Moumba River; −0.7587, 12.9810; 13 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19447. Table 2, Figure 12H.

Identification. Nine or more branched anal rays. Lateral line decurved below mid-line. Barbels absent. Flanks silvery and marked with numbers bars. Maxilla short and not generally reaching beyond center of eye. Snout rounded and, in breeding adults, studded with large granular tubercles.

***Raiamas buchholzi* (Peters, 1877)**

Material examined. GABON • 1, 131.91 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 16 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19384. • 1, 109.36 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19385. • 1, 74.51 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 16 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19450. • 1, 73.72 mm; Confluence of Moumba and Ogooué rivers; −0.8923, 12.9706; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19452. • 1, 73.58 mm; Ogooué River at Doumé, below the rapids; −0.8413, 12.9654; 17 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19386. • 1, 72.21 mm; road 19 east of Compagnie Equatoriale des Bois headquarters at stream crossing; −0.7442, 12.9994; 13 Sep. 2014; Gervais Koudaou, Thibault Cavalier de Cuverville leg.; OS19387. • 3, 68.58–76.07 mm; sand bank on left bank of Ogooué River at Doumé village; −0.8418, 12.9636; 15 Sep. 2014; Joseph S. Cutler, Brian L. Sidlauskas, Jean Hervé Mvé Beh leg.; OS19381. • 4, 62.77–116.61 mm; small stream near Hotel Escale de l'Ogooué, Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19379. • 1, 35.78 mm; Moumba River; −0.7587, 12.9810; 12 Sep. 2014; Joseph S. Cutler, Gervais Koudaou leg.; OS19456. • 1, 34.86 mm; Ogooué River at Doumé, below the rapids; −0.8413, 12.9654; 17 Sep. 2014; Jean Hervé Mvé Beh leg.; OS19727. • 3, 30.21–115.27 mm; road 19 east of Compagnie Equatoriale des Bois headquarters at stream crossing; −0.7442, 12.9994; 13 Sep. 2014; Gervais Koudaou, Thibault Cavalier de Cuverville leg.; OS19449. • 2, 29.02–29.04 mm; road 19 east of Compagnie Equatoriale des Bois headquarters at stream crossing; −0.7442, 12.9994; 13 Sep. 2014; Gervais Koudaou, Thibault Cavalier de Cuverville leg.; OS19454. • 8, 28.94–67.26 mm; Sébé River at sand beach near bridge; −0.9349, 13.3570; 20 Sep. 2014; Gervais Koudaou, Thibault Cavalier de Cuverville, Jean Hervé Mvé Beh leg.; OS19380. • 1, 28.87 mm; road 19 east of Compagnie Equatoriale des Bois headquarters at stream crossing; −0.7442, 12.9994; 13 Sep. 2014; Gervais Koudaou, Thibault Cavalier de Cuverville leg.; OS19453. • 1, 26.53 mm; small stream near Hotel Escale de l'Ogooué, Lastoursville; −0.8055, 12.7444; 7 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19451. • 2, 23.36–27.64 mm; small stream near Hotel Escale de l'Ogooué, Lastoursville; −0.8055, 12.7444; 8 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville leg.; OS19458. • 6, 21.68–27.16 mm; Moumba River; −0.7587, 12.9810; 12 Sep. 2014; Joseph S. Cutler, Gervais Koudaou leg.; OS19457. Table 2, Figure 12I.

Identification. Nine or more branched anal rays. Lateral line decurved below mid-line. Barbels absent. Flanks silvery and marked with numbers bars. Maxilla long and usually reaching well beyond center of eye, snout acute. 13–16 circumpeduncular scales, 46–52 scales in lateral line, 8.5–11.5 scales between lateral line and dorsal fin origin. Elongated spot on caudal peduncle.

***Brienomyrus brachyistius* (Gill, 1863)**

Material examined. GABON • 1 male, 138mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 11 Sep. 2014; John P. Sullivan leg.; CUMV98082. • 1 female, 135mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98111. • 1 female, 120mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 13 Sep. 2014; John P. Sullivan leg.; CUMV98112. Table 2, Figure 13A.

Identification. Nostrils separated from each other and from the eye. Teeth only in the middle of each jaw. Body moderately elongate. Anal fin extends beyond the end of dorsal. Distal tips of last anal and dorsal fin rays offset. Dorsal fin base 0.41–0.68 times as long as anal fin base. 25–31 anal fin rays; 47–66 lateral line scales.

***Ivindomyrus marchei* (Sauvage, 1879)**

Material examined. GABON • 1 male, 203 mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98176. • 1 male, 180 mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98174. • 1 male, 165mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98175. • 1 male, 137mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98173. • 1 male, 135mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98171. • 1 female, 135mm; Sébé River, left bank

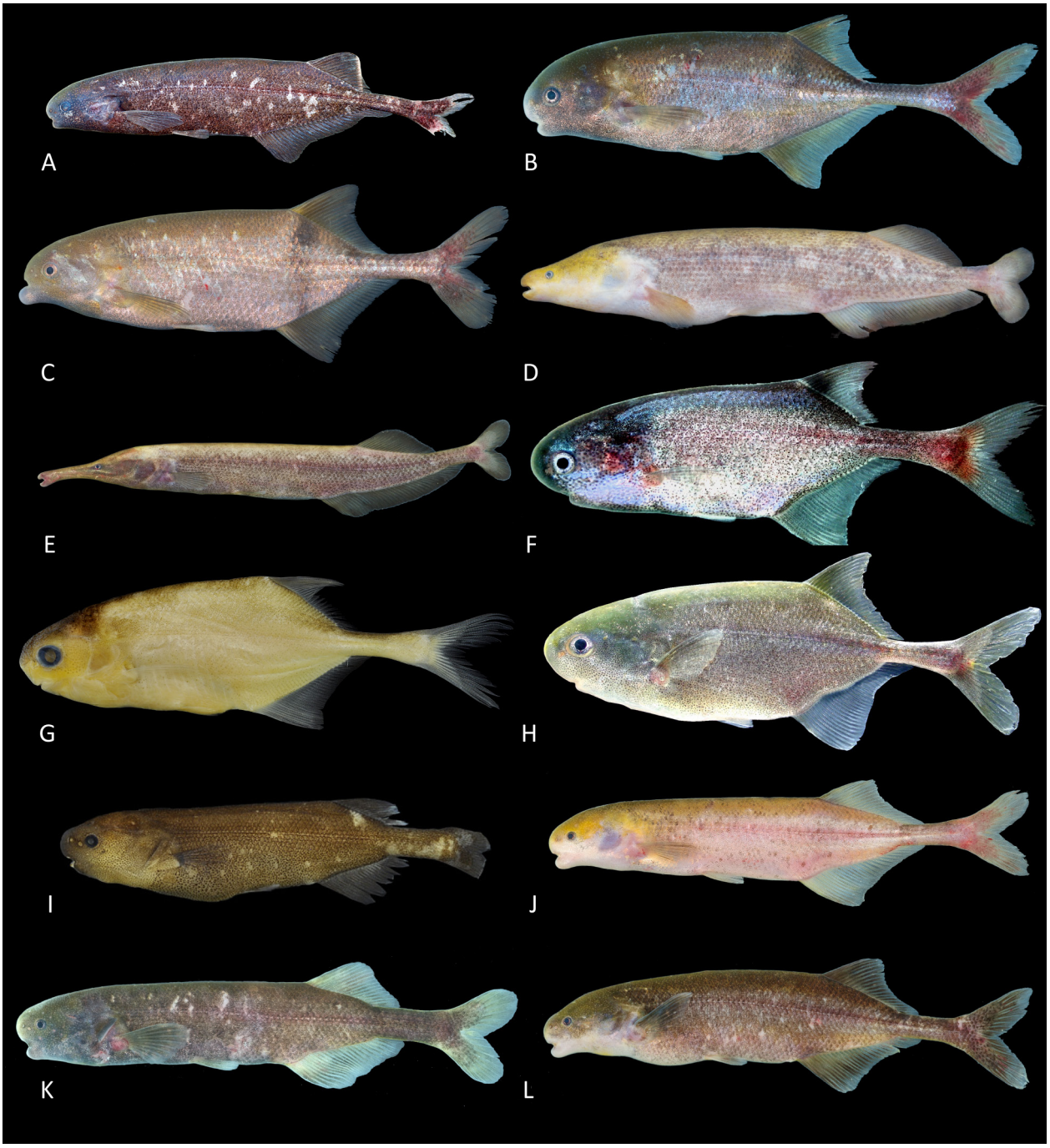

Figure 13. Mormyrids collected on this expedition. **A.** *Brienomyrus brachyistius*, SL = 120 mm, euthanized. **B.** *Ivindomyrus marchei*, SL = 135 mm, euthanized. **C.** *Marcusenius moori*, SL = 112 mm, euthanized. **D.** *Mormyrops nigricans*, SL= 228 mm, euthanized. **E.** *Mormyrops zanclirostris*, SL = 167 mm, euthanized. **F.** *Petrocephalus microphthalmus*, SL = 66.87 mm, euthanized. **G.** *Petrocephalus simus*, SL = 92.08 mm, preserved. **H.** *Petrocephalus sullivani*, SL = 77 mm, euthanized. **I.** *Stomatorhinus walkeri*, SL = 40.0 mm, preserved. **J.** *Paramormyrops sphekodes*, SL = 119 mm, euthanized. **K.** *Paramormyrops batesii*, SL = 103 mm, euthanized. **L.** *Paramormyrops ntotom*, SL = 147 mm, euthanized.

rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98172. Table 2, Figure 13B.

Identification. Nostrils close to one another, mid-way between eye and end of snout. Body moderately deep and laterally compressed. Caudal peduncle distinct, slender and elongate. Mouth subterminal, globular swelling under chin present. Five teeth in upper jaw, six in lower. Frontal profile straight or slightly convex. EOD peak P1 greater than 40% of peak-to-peak height, peak P3 less than 0.2% of peak-to-peak height.

***Marcusenius moorii* (Günther, 1867)**

Material examined. GABON • 1 male, 144 mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98170. • 1 male, 133 mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 22 Sep. 2014; John P. Sullivan, Marie-Claire Paiz, Alain Dole leg.; CUMV98183. • 1 female, 122 mm; Doumé rapids, left bank of Ogooué River; −0.8413, 12.9654; 17 Sep. 2014; Brian L. Sidlauskas, John P. Sullivan leg.; CUMV98145. • 4, 119.5–139.69

mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; OS19370. • 1 male, 118 mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 22 Sep. 2014; John P. Sullivan, Marie Claire Paiz, Gervais Koudaou leg.; CUMV98184. • 1 female, 112 mm; Doumé rapids, left bank of Ogooué River; −0.8413, 12.9654; 17 Sep. 2014; Brian L. Sidlauskas, John P. Sullivan leg.; CUMV98146. • 1 female, 111 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 11 Sep. 2014; John P. Sullivan leg.; CUMV98085. • 1 female, 106 mm; Doumé rapids, left bank of Ogooué River; −0.8413, 12.9654; 17 Sep. 2014; Brian L. Sidlauskas, John P. Sullivan leg.; CUMV98147. • 1 female, 105 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 14 Sep. 2014; Joseph S. Cutler, John P. Sullivan leg.; CUMV98124. • 2, 103.75–109.52 mm; Ogooué River at Doumé village; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Brian L. Sidlauskas, Jean Hervé Mvé Beh leg.; OS19373. • 1, 68.4 mm; Lélama Creek; −0.9961, 13.5257; 19 Sep. 2014 John P. Sullivan leg.; OS19374. • 2, 68.26–84.31 mm; Moumba River; −0.7587, 12.9810; 11 Sep. 2014; John P. Sullivan leg.; OS19372. Table 2, Figure 13C.

Identification. Nostrils separated from each other and from the eye. Body depth 26.6–32.8% standard length, head length 24.1–29.0% standard length. Snout blunt, mouth terminal, submental swelling prominent and forward–projecting. Eight circumpeduncular scales, 37–42 lateral line scales, 17–26 dorsal rays, and 24–33 anal fin rays. Dark vertical band between dorsal and anal fins.

Mormyrops nigricans (Boulenger, 1899)

Material examined. GABON • 1 male, 228 mm; Doumé rapids, left bank of Ogooué River; −0.8413, 12.9654; 17 Sep. 2014; John P. Sullivan, Brian L. Sidlauskas leg.; CUMV98148. Table 2, Figure 13D.

Identification. Nostrils separated from each other and from the eye. Teeth extending along the entire edge of both jaws, mouth terminal. Body moderately elongate, body depth more than 16% standard length. 10–12 circumpeduncular scales, fewer than 58 lateral line scales. Color dark grey to black with darker longitudinal lines, especially ventrally.

Mormyrops zanclirostris (Günther, 1867)

Material examined. GABON • 1 female, 212 mm; Sébé River: rocky outcrop below bridge, left bank; −0.9344, 13.3577; 22 Sep. 2014; John P. Sullivan, Marie-Claire Paiz, Alain Dole leg.; CUMV98182. • 1 female, 167 mm; Sébé River: rocky outcrop below bridge, left bank; −0.9344, 13.3577; 22 Sep. 2014; John P. Sullivan, Marie-Claire Paiz, Alain Dole leg.; CUMV98181. • 1, 94 mm; small stream on route CEB; −0.7725, 12.9117; 11 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville, Gervais Koudaou leg.; CUMV98096. Table 2, Figure 13E.

Identification. Nostrils separated from each other and from the eye. Teeth extending along the entire edge of both jaws, mouth terminal. Snout long, tubular, and trumpet-like. Snout length more than 70% of post-orbital length of head.

Petrocephalus microphthalmus (Pellegrin, 1908)

Material examined. GABON • 1, 80.78 mm; right bank of Sébé River, main channel near bridge; −0.9353, 13.3576; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19375. • 1 male, 70 mm; sandy beach near bridge on Sébé River; −0.9349, 13.3570; 20 Sep. 2014; John P. Sullivan, Brian L. Sidlauskas, Gervais Koudaou leg.; CUMV98158. • 1, 66.87 mm; wooded area on left bank of Sébé River upstream from sand beach near bridge; −0.9349, 13.3570; 20 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19371. • 1, 43 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 13 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; CUMV98200. Table 2, Figure 13F.

Identification. Nostrils close to one another and to eye; mouth inferior; body short and rather deep. No spot near base of dorsal fin. Dorsal fin with 15–18 segmented rays. 8–10 scale rows between the origin of the anal fin and the lateral line. Eye small, 21–24% of head length.

Petrocephalus simus (Sauvage, 1879)

Material examined. GABON • 1, 92.08 mm; left bank of Ogooué River at Doumé village, including small side channel; −0.8424, 12.9624; 15 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; OS19388. Table 2, Figure 13G.

Identification. Nostrils close to one another and to eye; mouth inferior; body short and rather deep. No spot near base of dorsal fin. Dorsal fin with 19 or more segmented rays. 11 or more scale rows between the origin of the anal fin and the lateral line. Mouth inferior. EOD with two peaks.

Stomatorhinus walkeri (Günther, 1867)

Material examined. GABON • 1 male, 78 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 11 Sep. 2014; John P. Sullivan leg.; CUMV98083. • 1 female, 71 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 14 Sep. 2014; Joseph S. Cutler, John P. Sullivan leg.; CUMV98122. • 1, 56 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 14 Sep. 2014; Joseph S. Cutler, John P. Sullivan leg.; CUMV98123. • 1, 38 mm; small stream on route CEB; −0.7725, 12.9117; 11 Sep. 2014; Joseph S. Cutler, Gervais Koudaou, Thibault Cavalier de Cuverville leg.; CUMV98076. • 2, 36.01–40.0 mm; road R19 between Lastoursville and Compagnie Equatoriale des Bois headquarters; −0.7725, 12.9117; 11 Sep. 2014; Jo-

seph S. Cutler, Thibault Cavalier de Cuverville, Gervais Koudaou leg; OS19376. • 3, 32.23–41.82 mm; road R19 between Lastoursville and Compagnie Equatoriale des Bois headquarters; −0.7725, 12.9117; 11 Sep. 2014; Joseph S. Cutler, Thibault Cavalier de Cuverville, Gervais Koudaou leg; OS19377. • 1 male; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 11 Sep. 2014; John P. Sullivan leg.; CUMV98084. Table 2, Figure 13I.

Identification. Nostrils separated from each other and from the eye, posterior nostril close to the border of the mouth. Pectoral rays 10–12, dorsal rays 18–20, pored scales of lateral line reach caudal peduncle. Body depth 25–29% standard length. 46–53 lateral line scales, 12–14 circumpeduncular scales.

***Paramormyrops sphekodes* (Sauvage, 1879)**

Material examined. GABON • 1 male, 139mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98162. • 1 male, 122 mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 22 Sep. 2014; John P. Sullivan, Marie-Claire Paiz, Alain Dole leg.; CUMV98177. • 1 female, 118 mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98161. • 1 male, 118 mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98159. • 1 female, 112 mm; Doumé rapids, left bank of Ogooué River; −0.8413, 12.9654; 17 Sep. 2014; John P. Sullivan, Brian L. Sidlauskas leg.; CUMV98154. • 1 female, 115 mm; left bank Ogooué river, just above rapids at Doumé; −0.8414, 12.9658; 17 Sep. 2014; Joseph S. Cutler, Jean Hervé Mvé Beh leg.; CUMV98152. • 1 male, 111 mm; Sébé River, left bank rocks below bridge; −0.9344, 13.3577; 20 Sep. 2014; John P. Sullivan leg.; CUMV98160. • 1 female, 97 mm; Doumé rapids, left bank of Ogooué River; −0.8413, 12.9654; 17 Sep. 2014; John P. Sullivan, Brian L. Sidlauskas leg.; CUMV98153. Table 2, Figure 13J.

Identification. Nostrils separated from each other and from the eye. Five teeth in upper jaw, six in lower. Fewer than 16 scales (typically 12) around the caudal peduncle. Head profile V-shaped when viewed from above. Upper profile of head rounded, mouth inferior. Head length 22.2% of standard length of less.

***Paramormyrops batesii* (Boulenger, 1906)**

Material examined. GABON • 1 male, 113 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98185. • 1 male, 103 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98186. • 1 male, 99 mm; Moumba Creek, under bridge within CEB concession between Ndambi and Miynza; −0.7587, 12.9810; 11 Sep. 2014; John P. Sullivan leg.; CUMV98093. • 1 male, 87 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98187. • 1 male, 86 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98189. • 1 male, 86 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98188. • 1 male, 78 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98190. • 1 female, 77 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98192. • 1 female, 73 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98191. • 1, 67 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98196. • 1, 64 mm; small stream on route CEB; −0.7725, 12.9117; 11 Sep. 2014; Joseph Cutler, Thibault Cavalier, Gervais Koudaou leg.; CUMV98098. • 1, 61 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98193. • 1, 56 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98194. • 1, 52 mm; small stream on route CEB; −0.7725, 12.9117; 11 Sep. 2014; Joseph Cutler, Thibault Cavalier, Gervais Koudaou leg.; CUMV98094. • 1, 50 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98197. • 1, 48 mm; small stream on route CEB; −0.7725, 12.9117; 11 Sep. 2014; Joseph Cutler, Thibault Cavalier, Gervais Koudaou leg.; CUMV98099. • 1, 42 mm; small stream on route CEB; −0.7725, 12.9117; 11 Sep. 2014; Joseph Cutler, Thibault Cavalier, Gervais Koudaou leg.; CUMV98095. • 1, 41 mm; small stream on route CEB; −0.7725, 12.9117; 11 Sep. 2014; Joseph Cutler, Thibault Cavalier, Gervais Koudaou leg.; CUMV98097. • 1, 35 mm; small stream tributary to Lelama Creek; −0.9983, 13.5321; 23 Sep. 2014; Joseph S. Cutler, Marie-Claire Paiz, Gervais Koudaou leg.; CUMV98195. Table 2, Figure 13K.

Identification. Nostrils separated from each other and from the eye. Five teeth in upper jaw, six in lower. 16 or more scales around caudal peduncle. Caudal peduncle less than 24.5% standard length. More than 72 lateral line scales.

Discussion

Previous to this expedition, Alfred Marche conducted the only extensive sampling in this zone in 1876–1867, when he collected a total of 42 species belonging to 10 families (Sauvage 1879, 1880). The 97 species of fish collected

on this expedition contribute significantly to the known ichthyofauna of the Rapids of Mboungou Badouma and Doumé Ramsar site and fill a major hole in our knowledge of the Ogooué basin's fish diversity. While some of those species, including *Enteromius camptacanthus*, *Raiamas buchholzi*, and *Marcusenius moori*, are widely distributed in the upper and lower Ogooué (Stiassny et al. 2007) and were already suspected to be present in the Ramsar site, others are entirely new to science, are already described species but with widely extended ranges, or were the subjects of longstanding taxonomic conundrums that we have helped clarify [eg. *Paramormyrops sphekodes* (Rich et al. 2017)]. These discoveries, including the description of the novel genus *Cryptomyrus* (Sullivan et al. 2016), exemplify the region's underexplored nature, and highlight the need for further collections and revisionary taxonomic studies. Such data in turn help catalog the biodiversity of newly formed protected areas and serve as baselines for environmental monitoring.

Of the 12 species Sauvage (1879) reported from Marche's Doumé collection, we recovered only two (*Paramormyrops sphekodes* and *Petrocephalus simus*) at Doumé proper, though all but *Labeobarbus compiniei* were recovered at other sites during the expedition. Neither Sauvage nor Marche specified if all Marche's species had come from the Ogooué itself, or whether some could have been from nearby tributaries. The absence of some of Sauvage's species from our collections at Doumé suggest that these early specimen series may include material from a variety of locations around the village, including nearby small rivers.

Conservation implications. The government of Gabon has shown a high degree of interest in conservation by designating 13 national parks and nine Ramsar sites to date. These designations, however, do not imply a high level of active protection for all these areas. Gabon's nine Ramsar sites, including the Rapides de Mboungou-Badouma et de Doumé, have no clear management restrictions or funding. Freshwater ecosystems in this region and globally, face considerable threats that fall into four major categories; 1) overexploitation, 2) introduced species, 3) habitat destruction, and 4) pollution (modified from Diamond 1984).

While the region encompassing the Rapides de Mboungou-Badouma et de Doumé Ramsar site is largely uninhabited, it is bounded upstream and downstream by small cities (Mouana and Lastoursville) and there are three fishing communities (Mboungou-Badouma, Lifouta, and Doumé) located within the Ramsar site. Overexploitation poses a threat to certain freshwater fishes throughout Central Africa, particularly the large migratory species of Siluriformes and Cypriniformes (Allen et al. 2005). On the Ogooué, however, most fisheries are artisanal and most of the fish is consumed locally, so the likelihood of local fisheries overexploitation is minimal.

Our team collected no invasive fish species on this expedition, but invasive fish species (including *Oreochromis niloticus*, *Heterotis niloticus*, and *Clarias gariepinus*) are widespread throughout Gabon. The Doumé area is particularly at risk for introduced species as the two largest aquaculture facilities in Gabon, SODEPARL (Societe d'exploitation du Parc de la Lekedi) and CEB (Compagnie Equatoriale des Bois/Precious Woods) are near Doumé. Fish farming efforts have often been linked to accidental species introductions and once invasive species become established, they threaten native species through predation, trophic cascades, competitive exclusion, and, in some cases, hybridization (Stiassny et al. 2011).

The most visible threat to biodiversity in this region is habitat destruction and pollution associated with mining, dams, and timber extraction. Immediately upstream of the Rapides de Mboungou-Badouma et de Doumé Ramsar site, mines in Franceville, Mounana, and Moanda and the Grand Poubara Dam drastically alter the Ogooué watershed and threaten biodiversity and ecosystem function. Mining—especially large, open mines—generates pollution and erosion and is detrimental to river health. The government of Gabon plans to develop new mines in the region including mines near Franceville and Okonja. Active forestry concessions border the Ogooué on both the north and south of the Ramsar site. Industrial extraction of timber has been known to modify patterns of sediment run-off and transport, ultimately affecting ecosystem functioning and biodiversity (Gerbersdorf et al. 2007). Effectively protecting the Rapides de Mboungou-Badouma et de Doumé Ramsar site will require management of both the immediate site and the watershed.

During the expedition we collected several species that appear to be entirely new to science, and these discoveries exemplify the region's underexplored nature and highlights the need for further collections and taxonomic study. This article is not an exhaustive species list for the Ramsar site Rapides de Mboungou-Badouma et de Doumé, but it does greatly expand the knowledge of the biodiversity in the region and serves as a foundation for the development of resource management plans in the area. We encourage others to explore, investigate and protect the Rapids of Mboungou-Badouma and Doumé region.

Acknowledgements

We express our sincere gratitude to the local authorities, notably the governorship of the Ogooué-Lolo province, and the community leaders, local authorities, and citizens of the villages and towns visited during this expedition for their welcome, support and assistance in facilitating the successful sampling and the well-being of the researchers. The Nature Conservancy (TNC) organized, financed, and executed the field sampling expedition. CENAREST (Centre National de la Recherche Scientifique et Technologiques) and ANPN (Agence National des Parcs Nationaux) facilitated the research permits and authorizations required to carry out the fieldwork and

export specimens. Special recognition goes to the staff from the Wildlife Conservation Society (WCS) and the Compagnie Equatoriale des Bois/Precious Woods (CEB) for their logistical support. We also thank the ichthyological community including Melanie Stiassny, Malorie Hayes, Jouke Van der Zee, Anton Lamboj, Jon Armbruster, John Friel, and Adrian Indermaur, who contributed to this effort through their collaborative taxonomic guidance on email, social media, and other platforms. Oregon State University's PROMISE program supported Kathleen Knight in a summer internship at the Oregon State ichthyology collection, during which she edited and arranged many of the photographs that appear in figures herein. The Gabon-Oregon Center for Transnational Research facilitated and sponsored Brian Sidlauskas and Jean Hervé Mvé Beh's participation in field and laboratory segments of this research, respectively.

Authors' Contributions

JSC, YF, JPS, JHMB, and BLS collected the data and identified the specimens. JSC, JPS, JHMB, and BLS took photographs of recently euthanized or preserved specimens. JSC wrote the text with significant contributions from JPS, JHMB, and BLS.

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